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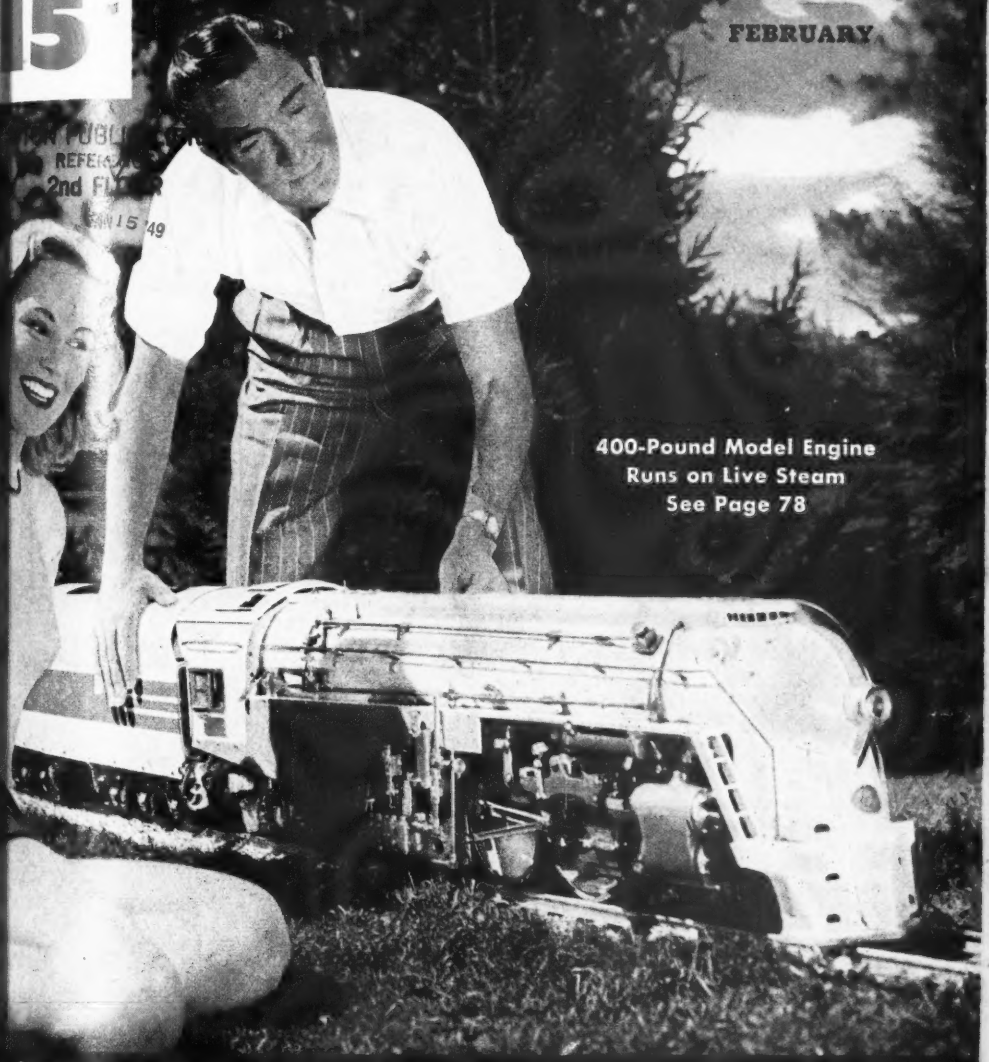

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See Page 78

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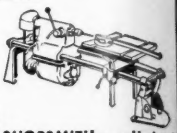

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special features

Most Dangerous Job? 61

How Radar Sentries Will Guard America 62
By Frank Tinsley

I Rode On A Highway Of Diamonds ... 64
By Henry Albert Phillips

New In Science 67, 76

Is Your Job Killing You? 68
By Donald G. Cooley

MI Tests The '49 Cadillac, Oldsmobile, Buick 70
By Tom McCahill

Hobby Hall Of Fame—Glenn L. Martin .. 74

Roto-Chutes For Rocket Pilots 75

Assembly Line For Baby Hudsons 77

Model Maker's Dream Engine 78
By Fred M. De Ripperda

Do Prehistoric Monsters Still Exist? 80
By Willy Ley

Master Micro-Carpenter 84
By Louis Hochman

New For The Sportsman 86

New For The Home 87

Hair Mail Special 88

Money-Making Idea—I'm A Mail-Order Cabinet Maker 90
By Al Grossman

Helicopters Grow Up 92

This Month's Prize Gadget—Magnetic Soap Holder 93

Farm-Boy Inventor 94

Old In Science 95

Editor's Workbench 20

Invention Clinic 24

(continued on page 10)

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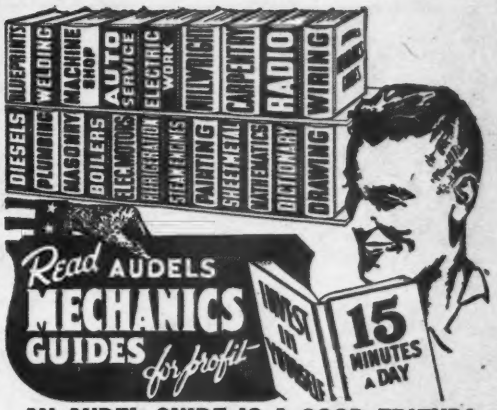

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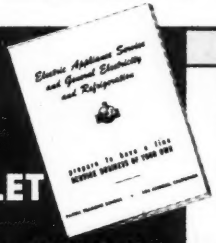

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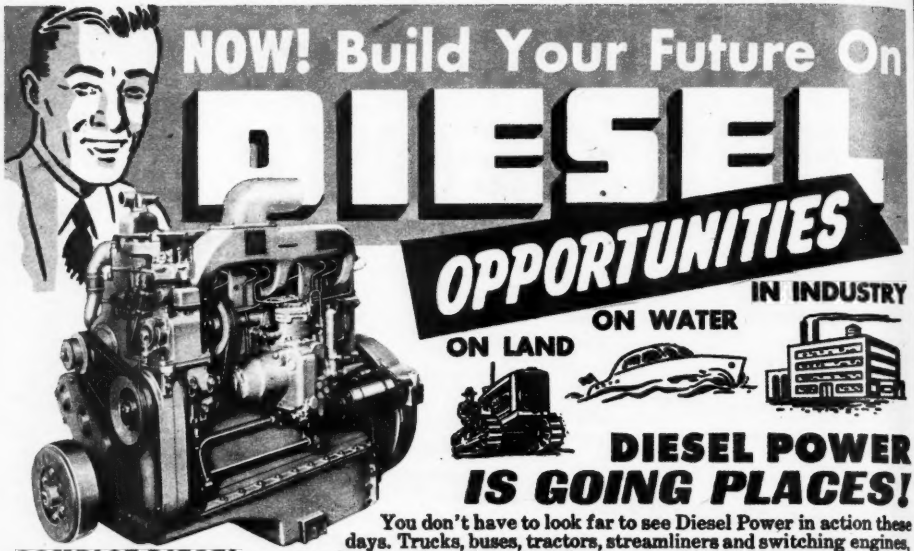

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crafts and hobbies contents

Continued from page 2

Workbench Awards 96

Power Buffer 98

Modern Table Lamp 102

How To Hang Fabric Wall Covering 104

Control-Line Sparrowhawk 108

Beware Of Lightning 114

Snipe Sailboat—Part I 116

Making Concrete Retaining Walls 120

Hanging Garden 123

Car Care 124

Behind The Wheel 125

Monthly Photo Contest 126

Wallpaper Picture Backgrounds ... 127

Modernize Your Graflex 128

Photo Handies 131

Question Box 131

Telescope Maker's Page 142

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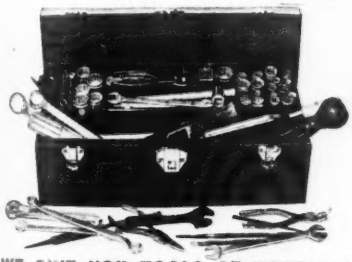

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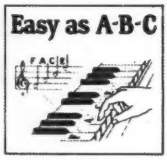

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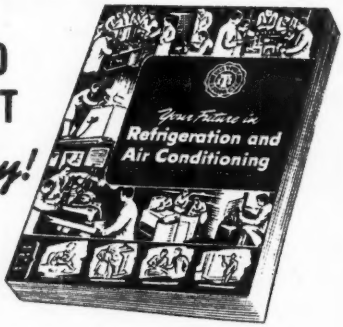

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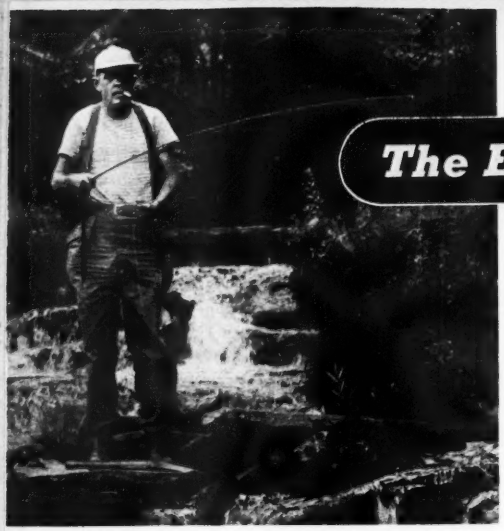


The Editor's Workbench

Don't shoot, Warden! MI Feature Editor Gil Paust was "shot" here last year during legal trout season.

Are Scientists Monsters?

"Lord, what has happened to people's thinking!" writes a Mr. R. C. C. of San Francisco, telling us how "shocked" he was to read artist-writer Frank Tinsley's article, Atomic Duster . . . Deadliest Weapon, in the December issue. Quoting Mr. Tinsley's statement that his atomic-powered, ramjet missile (see cut) is not pure dream dust but that such a weapon is mentioned in the latest progress report of the hush-hush Nuclear Energy for Propulsion of Aircraft project, the reader asks:

"How can a man have such a perverted mind as to call a weapon designed for wholesale cold-blooded murder *progress?* What right has science to create and release such forces under the guise of progress and jeopardize the life of every living thing?"

Science, believes R. C. C., "stands condemned as a terrifying Frankenstein which has gotten out of hand, and society stands condemned for approving of this monster and supporting it with its taxes.

"I think that MECHANIX ILLUSTRATED, as a scientific magazine, could surely find something more progressive on which to report."

The phrase "progress report" as used by the NEPA (or any other research agency, for that matter) simply means a report of technical progression toward a scientific objective and does not imply that the objective is good or bad, moral or immoral. In this case, the NEPA's progress report covered all phases of atomic-energy power-plant development, for peaceful as well as warlike uses.

But since Mr. C. chose to interpret the word "progress" as he did, we think his questions deserve an answer.

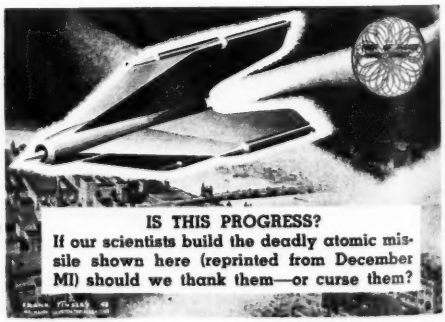
For a good many years people have been lambasting "science" for starting wars, slaughtering human beings, demolishing property and perpetrating uncounted crimes against the human race. The charge that science is a "terrifying Frankenstein which has gotten out of hand" is old hat by now and we won't rebut it again—except to remind our correspondent that in Mary Wollstonecraft Shelley's famous story, Frankenstein was *not* the *monster* but was the name of the fictitious physiology student who created the monster and then discovered to his horror that he couldn't control it.

When scientists come up with a newer and more deadly weapon for killing people, can you call that progress? We think it all depends on where you sit. Was it "progress" when science handed the American infantryman the "cold-bloodedly murderous" bazooka which enabled him to destroy rather than be destroyed by Nazi tanks? Was it "progress" when science evolved the portable flamethrower with which our soldiers and Marines wiped out Jap machine gun nests instead of being wiped out themselves? Was it "progress" when our scientists developed these and dozens of other weapons with such cunning and murderous success that we won the war instead of losing it?

You're darned right it was!

If, ten years ago, the United States of America had been armed with far deadlier weapons of war—and a whole lot more of them—than our potential enemies had, there might never have been a World War II. And even if the Nazis and Japs had risked war with us anyway, in spite of our superiority in weapons for "wholesale cold-blooded mur-

[*Continued on page* 154]



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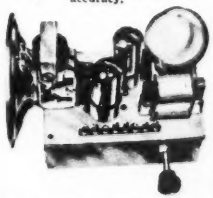

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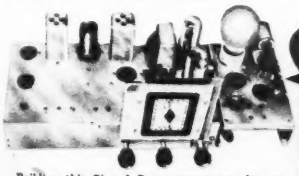

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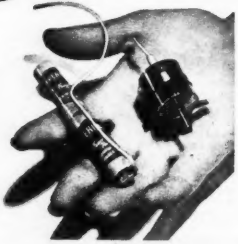

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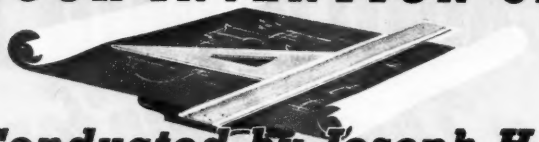

Conducted by Joseph H. Kraus

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Address your inquiries to "Your Invention Clinic," MECHANIX ILLUSTRATED, 67 West 44th Street, New York 18, N. Y. Mr. Kraus will answer as many letters as possible in this column. His services are free.

Mechanical Egg Peeler

Lloyd E. Hurley of Grand Rapids, Mich., sends a drawing and description of an egg-peeling unit.

ANSWER: In our opinion the speed of operation of your peeler could be improved if the spring were made to exert pressure when released by a catch or button. Before patenting, make comparisons between this and other similar items on the market. Start with the same number of eggs in each case, give the same amount of instruction to the operator and time the runs with a stop watch.

If your unit works with comparable speed and ease it might be well to take more aggressive steps toward patenting and production.

Pyramid Puzzle

Calvin J. Newhart, Jr., of Ithaca, N. Y., asks about a puzzle with three upright sticks and six vari-diameter discs with holes in the center. Object is to move discs from one stick to another, one at a time, never putting a larger one on top of a smaller one.

ANSWER: You have re-invented the Great Pyramid Puzzle popular among the ancients. In its original form the pegs were at the apex of a triangle. But the modified form with the sticks in line has been available for many years. It's identical with yours.

Drainback Preventer

Donald Hopkins of Dearborn, Mich., has a design for a unit which he thinks should prevent sewers from backing up into cellars. He expects to make a number of the articles and test them.

ANSWER: Unless we misunderstand the operation of your device, there's nothing to it at all. It seems you must close off all other openings in the drainage system if you expect it to function. If this could be done easily, there would be no need for your drainback unit.

The only thing you seem to accomplish is to satisfy your own curiosity. The pipe and indicator which you propose to use should tell you how high the water is standing in the sewage system. But you may have to wade through water in the cellar to get close enough to the pipe to see what the register indicates.

We're not impressed with your system of testing, either. You would be better off with a small model. An "on location" test is not satisfactory unless done in a series of houses all of which get water backflow every time it rains hard. If your device corrects the condition in alternate homes, then further action would be indicated.

Gyroscopic Toys

Henry Szczygielaki of Brooklyn, N. Y., claims to have invented a new gyroscopic toy.

ANSWER: Your design was well known during the latter part of the last century. The old method of spinning a gyroscope was identical with the system you've decided on. The toy probably would be enjoyable today but it's not being manufactured. However, anyone can make it.

Motor Controller

Milton E. Knight of Seagoville, Tex., has designed a controller for motors operating on a three-phase system. He wants to know if it has been developed before and what the demand is likely to be.

ANSWER: You should engage the services of a patent attorney and instruct him to have a search made to determine if there is anything patentable in your design. Then discuss values with electrical engineers or visit professors of electrical engineering in your state college.

You gave us insufficient details on which to base an understanding of the operation of the controller. But we assume that you have built

[*Continued on page* 32]

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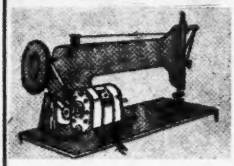

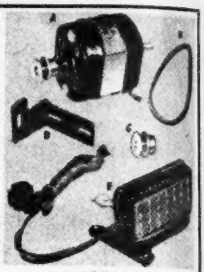

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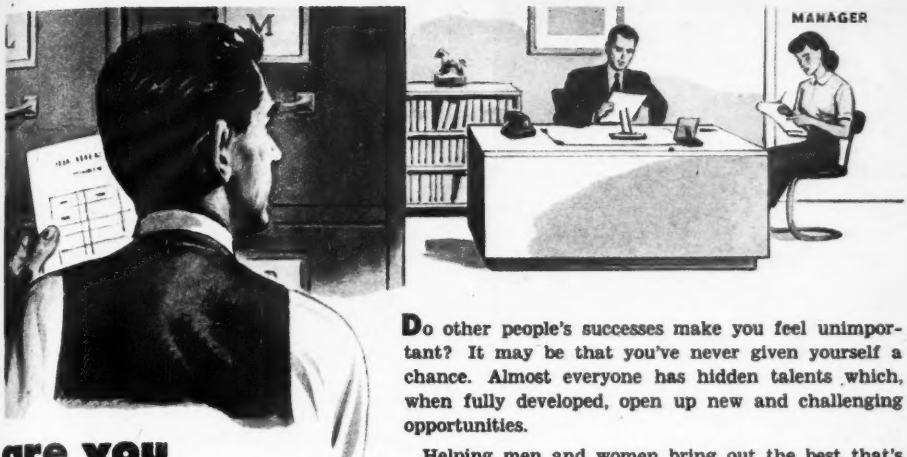

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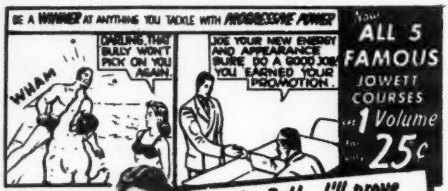

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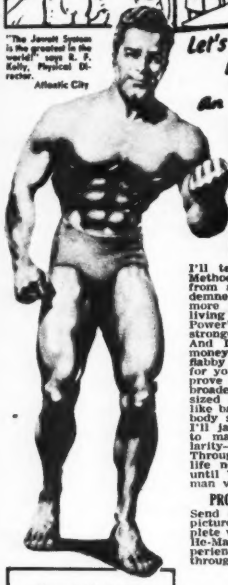

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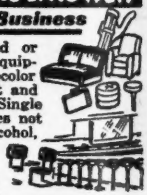

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[*Continued from page* 24]

and tested the unit. The idea should not be dropped now. To answer both your questions we would have to know a lot more about the mechanical and electrical features of your design.

Soap Container

H. A. Kilpatrick of Atlanta, Ga., has applied for a patent on a soap container and now wants our opinion of its value before proceeding further.

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Working Models

James M. Vosburgh of Chicago, Ill., asks several questions concerning an invention which he won't describe.

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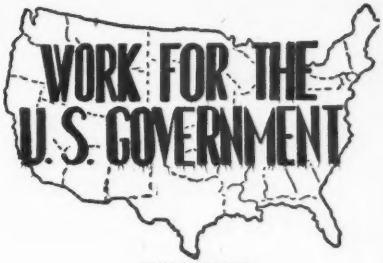

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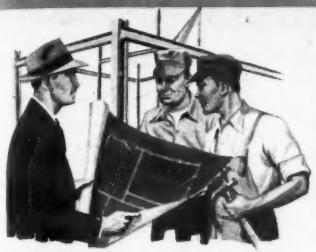

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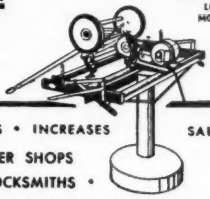

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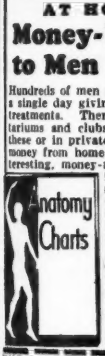

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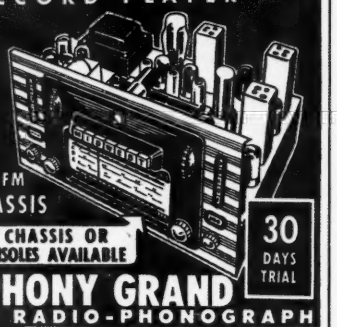

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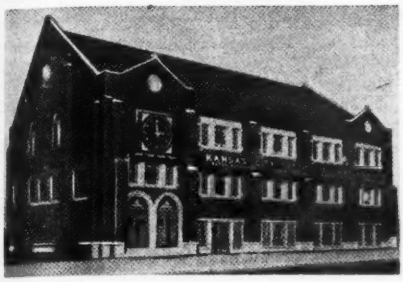

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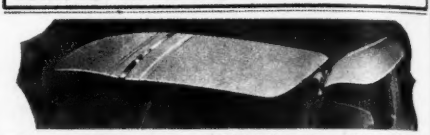

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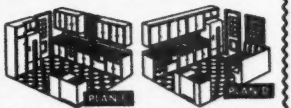

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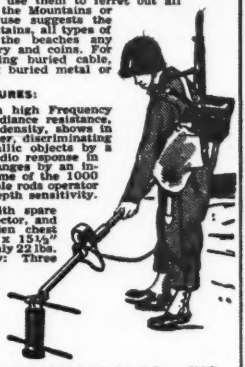

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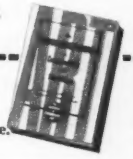

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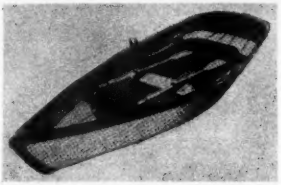

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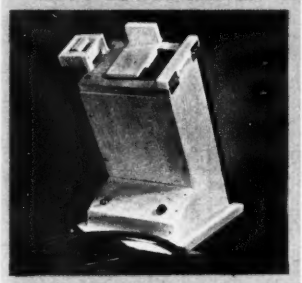

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GUSTAVE MILLER—Patents and Trade Marks—29-C Warner Building, Washington 4, D. C. Registered Patent Attorney, Associate Patent Examiner, U. S. Patent Office 1922-1929.

INVENTORS. FOR "Record of Invention" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

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INVENTOR'S GUIDE free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7, N. Y.

PATENTS

IF AN inventor believes he has an invention, a search of the most pertinent prior U. S. Patents should be made and a report obtained relative to its patentability. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 1389 Victor Building, Washington 1, D. C.

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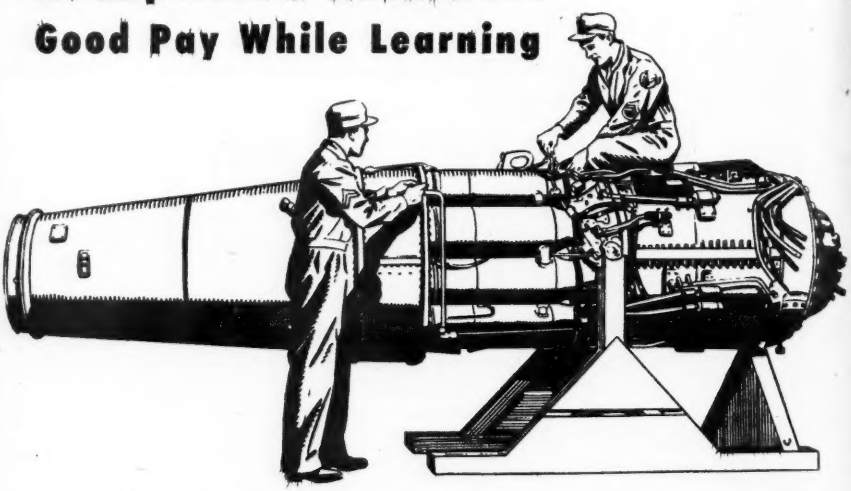

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mechanix illustrated
February 1949

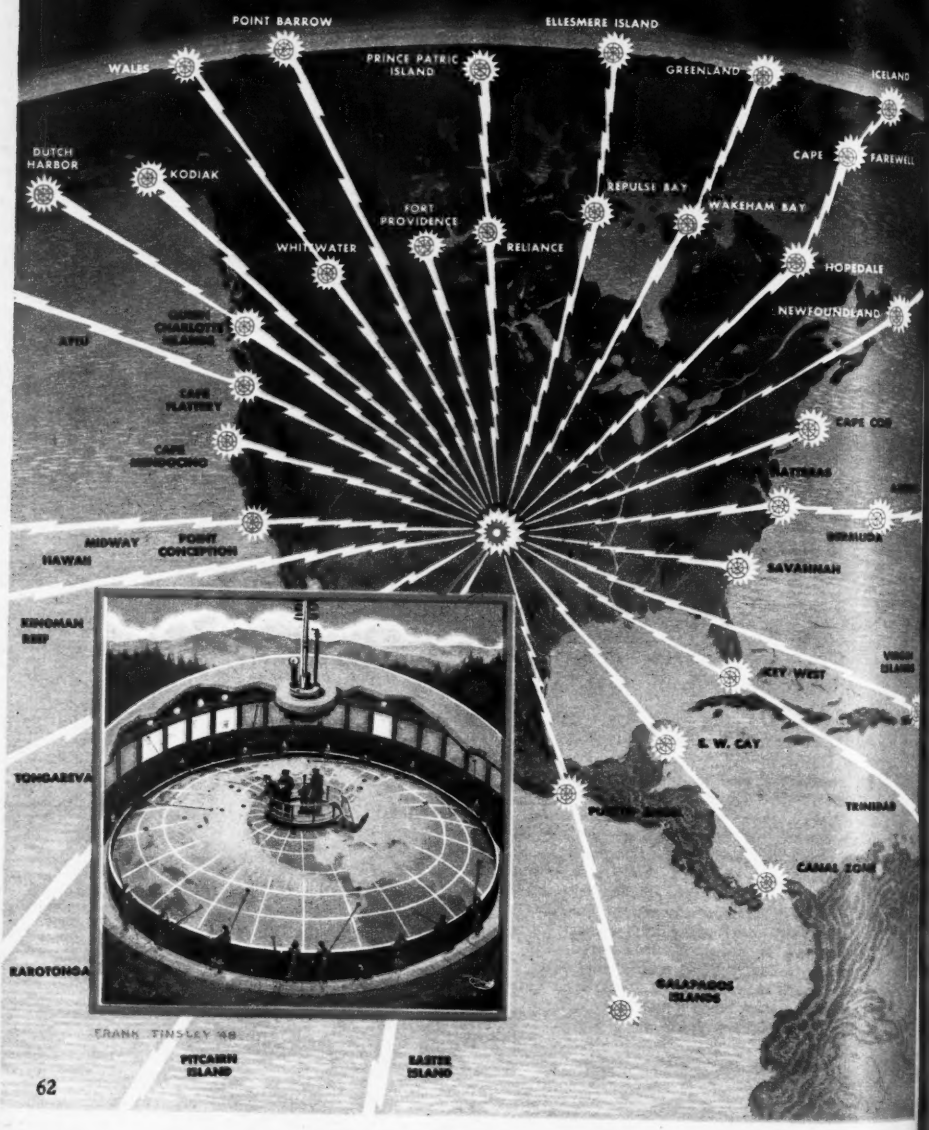
Most Dangerous Job?

"I'd rather be shot at than do the shooting," says Leo Krouse, 58-year-old New Yorker, who faces police firing squads to demonstrate a new 14-lb. bulletproof vest for the Spooner Armor Co. "The shooter's really the one on the spot—not me. He has to make sure he hits the armor." Slugs spot his vest, above, but don't even flick the ash off his stogie. He's been stopping bullets for 30 years and never been nicked—yet. For other dangerous jobs, see the article Is Your Job Killing You?—page 68.

International photos from Sunday Mirror

How RADAR SENTRIES

With a centrally controlled network like this, says the author, we could insure ourselves against an atom war Pearl Harbor.



Will Guard America

By Frank Tinsley

ELECTRONIC watchdogs may save you from atomic destruction!

Just one sneak atom-bomb attack on a single target city would cost thousands of American lives and millions of dollars in vital property. Our only guarantee against such an atomic catastrophe is the creation of a system of overlapping search radars to warn us against approaching disaster.

The advent of 1000-mph raiders and long-range guided missiles cuts the margin of precious warning time. Our sentries must be posted far afield or the confusion caused by large numbers of missiles launched simultaneously could cause a breakdown just as the British spotting system was disrupted by V-2 attacks during World War II.

This type of protection system is being urged by F. H. Lack, chairman of the mobilization committee of the radio industry. He suggests that radar stations be arranged in concentric circles so that their electronic eyes would scan every inch of approach to the continental United States.

The outer ring in the network would be as far flung as our possessions and defense treaties allow. It would detect the movement of long-range bombers and missiles early in their flight. The inner or shoreline ring would pinpoint sneak raids by short-range, submarine - launched missiles or carrier planes.

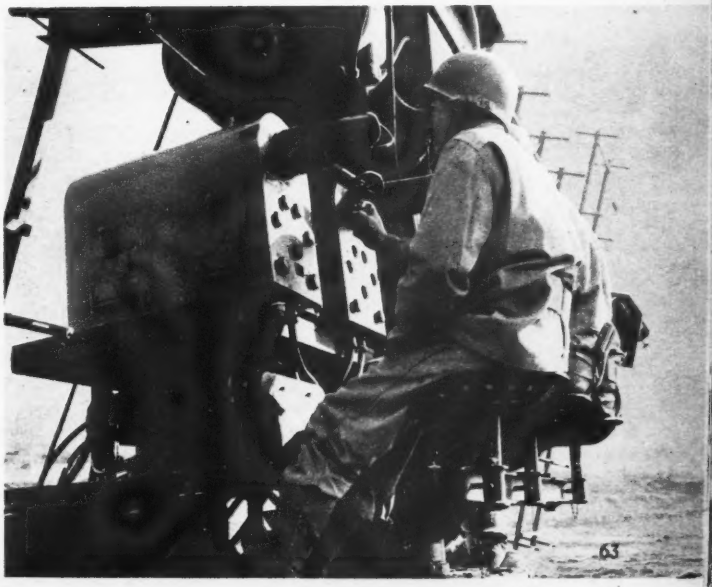
Radar images picked up by the day-long radar sentries would be sent over a continuous video transmission to a command center where necessary defense measures could be undertaken immediately. The operation commander would dispatch interceptor planes and ground-to-air missiles from any point on the radar ring. The whole setup would be augmented with radio, telephone and teletype communications wherever possible.

Illustrations on the opposite page show possible location points for such a network. Search stations are indicated by red radar aerials on white stars; converging video paths and relays are represented by flashes.

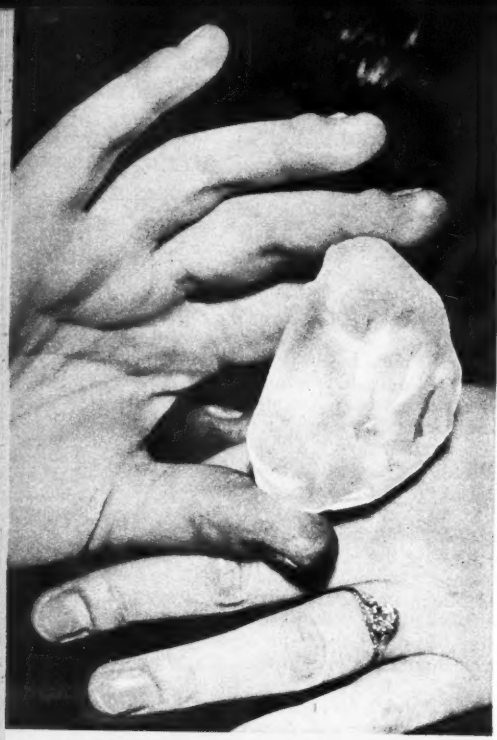
The inset shows one possible layout of the central control post. Placed in a "pulpit" overlooking the situation map are the operations commander and his aides. The map shows the entire search area of the system. And beneath its floor is a communications center through which the commander can talk with any plane, station, base or headquarters in the system.

Around the walls of the circular building are video screens and control panels, each tuned in on a specific radar post. The screens are gridded so that distances between friendly and enemy air units can be computed at any moment. In the gallery, Wacs record movements on the map.

The cost of this network of electronic watch-dogs would be terrific. But in the long run, every dollar spent might well be matched by a life saved. •



Armies of radar operators on 24-hour duty could supply the command center with reports of enemy air activity.

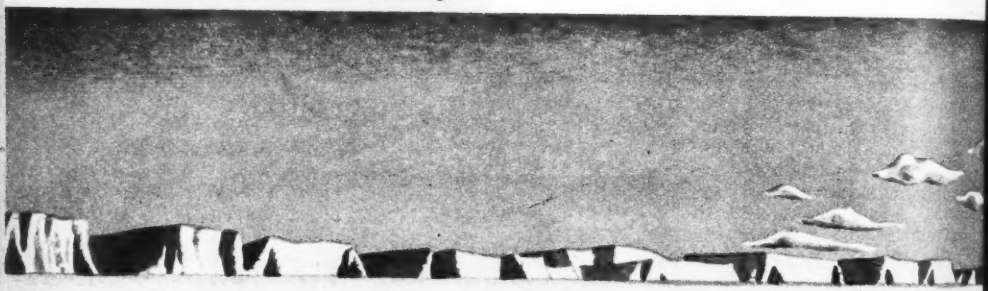


MILLION-DOLLAR GEM: once the largest in the world, the Jonkher diamond weighed 726 carats. Compare it with the two-carat jewel in the ring.

I Rode on a *HIGHWAY OF DIAMONDS*

MI's correspondent visits a fantastic land of precious jewels in South-West Africa.

By Henry Albert Phillips



WARNING!

You are approaching diamondiferous territory. TURN BACK! Trespassers are liable to suffer bodily harm, a fine of 500 pounds or five years in gaol.

De Beers Consolidated, Ltd.

THAT'S the sign which greeted me a couple of miles outside of Luderitz in South-West Africa. Inside the ominous-looking gates was the diamond country—soil and sand laden with precious gems like almonds in a Hershey bar. I had imagined what the land of diamonds was like and I was about to see for myself at last.

For five days I had traveled on one of the world's worst railways going from Johannesburg across the Namib desert to Luderitz. There, I was picked up by old Schweiger, a company hired-hand who was driving the car the De Beers people had sent to fetch me to the mines at the other end of the diamond fields at the mouth of the Orange River.

We came to a gate in the high wire fence and an armed guard stepped out of a little house. He turned to Schweiger as though I weren't there. "Credentials? Where did he come from? What does he want?" For a moment I thought he was going to turn the German police dogs on me that were sniffing and snarling around us.

Finally I signed a document waiving all rights and claims to indemnity in case of accident and the gate was unlocked. As it creaked open our car shot through into the forbidden land of precious gems.

Disappointing, I thought, as we passed over the broad desert road. The land was as bald of vegetation as sandpaper—but red-hot sandpaper.

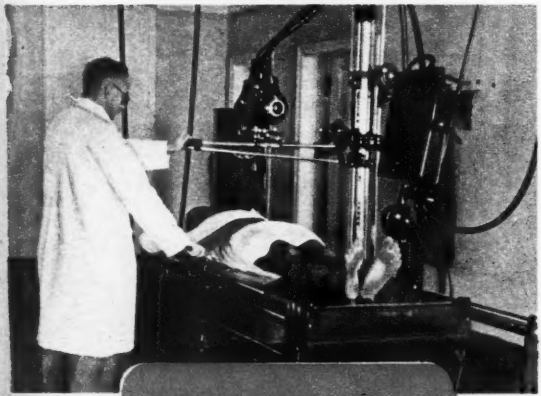
"You know, my friend," Schweiger said, "you are now driving over a highway paved with diamonds. This ground is filthy with gems and when the road was paved it was far too much trouble even to attempt to separate the diamonds from the gravel!"

Suddenly, Schweiger stopped the car and jumped out. I followed. He picked up a crystal stone the size of a prune pit and placed it in my hand. "Six carats. Pure white. Over the counter in London it'd bring 5000 pounds."

My palm itched. The tall stories were true! It was easy to see now why they had all that barbed wire, armed guards and man-eating dogs. I noticed Schweiger

SIFTING the gravel through a crude sieve separates the gems from the rocks. These native "diggers" found 20 carats in the pan.

SORTING the rough stones is a job reserved for the "Boss." He also keeps a watchful eye on the workers to prevent jewel thefts.



SEARCHING for diamonds isn't strictly a mining job. The X-ray searches everybody so it really doesn't pay to swallow a handful!

watching me closely so I let the $20,000 diamond fall back into the sand like a fish into the sea.

We got back into the car. I pulled my helmet down and squinted at the most desolate and poverty-stricken stretch of land I had ever seen. So this was the kind of hell hole where they mined those precious stones that beautiful women are so proud of!

"Ten thousand square miles of caked earth," Schweiger was spouting, "studded with diamonds."

"Why don't they have an army of diggers, shoveling out the stones?" I asked.

"If they unloaded the diamonds on the market at that rate, they wouldn't be worth sixpence. These alluvial fields threatened to disrupt the whole market some time ago and ruin De Beers. So they leased the entire area and regained control of 95 per cent of the world output. They control all sources and sales—and thus control the price of every carat. Did you know it is illegal for an individual in South West Africa even to possess an uncut or unset stone?"

We drove along the ragged roadbed and I looked about me at the great stretches of monotonous sand, the blue mountains to the south and the violent green sea. Schweiger continued, "I guess you can't blame the natives for being superstitious about diamonds. They call them 'devil stones' because they think there's a devil in each stone that'll bring someone bad luck."

"I'd take the chance," I said.

"I had a chum in the Camel Corps, once," Schweiger went on. "Rum got him down and he became an illicit diamond buyer, called I. D. B. here. He had a racket he worked with the natives who lorried in our supplies. One crew smuggled in a dog on every trip. Somehow he was fed a piece of meat studded with diamonds and then let loose at the gate. When he wandered outside the area, he was shot for what he had inside of him. Of course, the law caught up with my chum and now he's out of jail and a beachcomber instead."

"Living off his profits?"

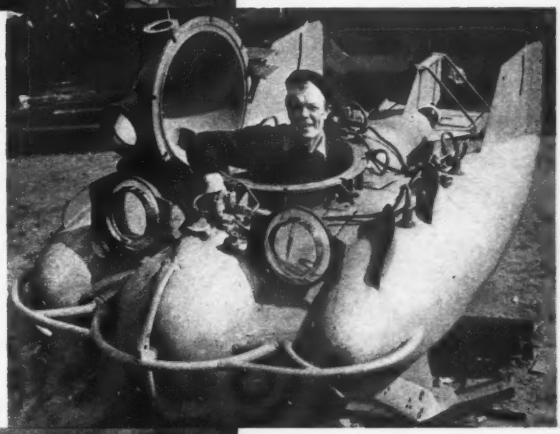
Schweiger disregarded me. "Two per cent of all the diamonds produced probably slip through and get into the hands of I. D. B.'s."

The sun was getting low and nubbins of green grass and faded bushes began to mark the roadway. The muddy waters of the Orange River were near. Finally we reached the central works of the Orange River Mouth Alluvial Diamond Fields.

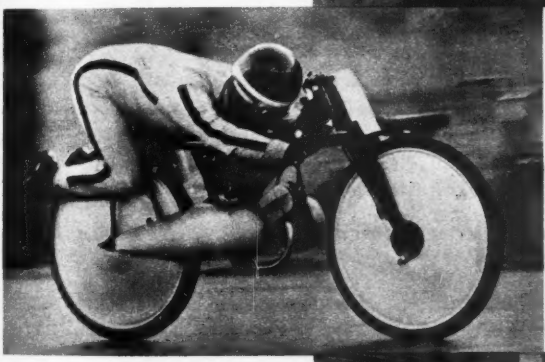
About 350 [*Continued on page* 146]

NEW in SCIENCE

Heat Bomb is a warmth-loving, guided missile which is designed to "home-in" on any target which radiates more heat than its immediate surroundings. The Air Force, which is experimenting with this bomb, calls it the VB-3.



Scrap-Heap Sub moves along the ocean bed in search of wrecked vessels. Inventor Peter Luetjens, a German mechanic, claims he can descend 900 feet and remain underwater for more than four hours. Two searchlights, capable of penetrating 60 feet at a depth of 210 feet, provide him with enough light. The craft must be towed by a surface vessel.



Zoom Bike is a weird, spokeless machine which broke the 75 c.c. motorbike record when it hit an average of 45 mph. The strange-looking bicycle is made in Italy by Moto Guzzi. Although it has a seat, the rider gains speed by racing in this awkward position.

Aqua-Monster is a pontoon-bottomed aquaplane which looks like something from Mars. Its builder, Leo Daniels of Export, Pa., says the 15-foot-long, eight-foot-high craft will make at least 65 mph on the water. The power plant of the boat is a Continental motor.

"Kiss of Death" is what Lion-tamer Alfred Rhodes calls this affectionate [illegible] monkey.

Is Your Job Killing You?

A desk can be deadlier than the daring life on a flying trapeze—if a secret urge is making you literally work yourself to death.

By Donald G. Cooley

ALFRED Rhodes, professional stunt man, contemplated the fact that nobody had jumped off the Golden Gate Bridge and survived. So he decided it was up to him to be the first to leap and live. All in the day's work, he figured.

He planned the job with meticulous care. Main problem, he reasoned, was to hit feet first and knife cleanly into the water. He rigged up a baby parachute to keep himself from flopping over during the fall and protected his body with a special padded rubber suit.

He waved to the crowd on the bridge, then calmly stepped over the side. The little white 'chute opened neatly. From the height of the bridge nothing looked more dangerous than that 200-foot drop. And nothing was. His body turned despite the 'chute and he hit the water flat on his face.

Rhodes' job *did* kill him. But most dangerous jobs actually are a lot safer than they look.

Ask Cannon-Ball Baker, the veteran racer who has been burning cars back and forth across the country for decades and has had thousands of chances to kill himself with a split second of carelessness.

"It's all in your head," Cannon-Ball says. "If you think you're gonna get killed in a

crash, you'll get it that way. Me, I think I'm gonna die in bed—peaceful."

Nearly all of those daring young men who shiver your spine when they fly through the air at the circus get their training from Arthur Vasconcello in a gym at Bloomington, Ind. Art and his wife, known professionally as "The Flying Concellos," declare that none of these high-flying lads and lasses is troubled by visions of a broken neck. Trapeze artists do take a net-fall now and then, Art admits, but their job is really much less hazardous than boxing.

How would you like to make a living by dangling from a window 80 or 90 stories above the street? Make your flesh creep even to think about such a giddy business? Well, you may know of a million jobs you'd like better but few of them will be any easier on your health than window washing. Window washers of the Empire State Building, highest structure in the world, have a safety record as clean as their window panes.

Dr. Raymond Ditmars, famed reptile authority spent a lifetime collecting, cajoling and milking deadly snakes of their venom. He never suffered even a fang scratch.

On the other hand, the "safest" work in the world can be murder if your personality can't take it.

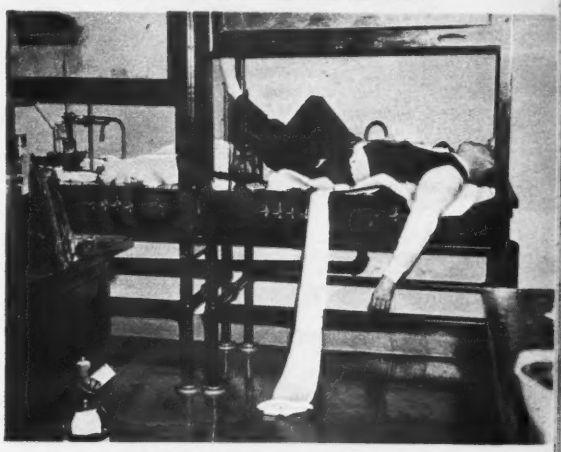
Dr. Murray C. McNab, 38, of Cranford, N. J., brooded about his routine work as a research chemist. He sprawled out on a table in his experimental lab. Before he turned on the gas, he penciled a note that said in part:

"This is my last experiment and it is self-destruction."

For seven years Ross Lockridge, Jr., went through a daily grind at his desk writing a novel. Shortly after his book Raintree County made him nationally famous, he took his life. Joshua Loth Liebman died in his forties, apparently broken by the strictly nondangerous job of lecturing, counseling, writing and church work that fell his way after the astounding success of another current best-seller—ironically titled Peace of Mind.

A Brooklyn storekeeper, Alfred Mercuri, let the dull but frustrating work in his food shop get him down. Last summer, damp clogged his sugar dispenser. [*Continued on page* 150]

Chicago firemen had to drag this window washer down to safety. Usually his job only looks dangerous.



Dr. McNab worked himself to death in his research laboratory. This experiment was his last—suicide.

This daredevil crashes his driverless car through fire for a living—but he may outlive most of us.

America's finest car is what Tom McCahill calls this new Cadillac.

MI TESTS THE '49 CADILLAC OLDSMOBILE BUICK

In a merry old Oldsmobile, Tom looks over the snappy new one.

CADILLAC

By Tom McCahill

CADILLAC has always been the top car in the General Motors garage. Now, with the 1949 model, Cadillac has become the top car in anybody's garage. It's unquestionably America's finest automobile to date.

The '49 Cadillac has a brand-new, valve-in-head, V-8 engine which develops 160 hp. With this engine Cadillac, despite its large size, outperforms just about every American car now being made.

The car I tested was a four-door sedan. It drives and handles with effortless ease. I could find no faults or usual big-car disadvantages even in tough New York City traffic where a large car often proves awkward. In fact, my only criticism is that I could have used a bit more leg room. Another inch would have been welcome to a 6-footer like me.

On the open road, this new auto really comes into its own. On the flat, it has the acceleration flash of the finest imported racing cars. And it climbs hills like a gazelle. Here are the acceleration figures: 0 to 60 mph in 12.1 seconds; 0 to 70 mph in 15.4 seconds; and 0 to 80 mph in 22.8 seconds. Quite an automobile, this Caddy!

In the top-speed department, Cadillac looks like it may crack the 12-year-old American stock-car record of 107 mph made by the Cord. It will definitely do better than 105 mph. Weather and wind conditions made it impossible for me to determine top speed accurately, but readings varied from 105 to 110 mph.

Its body appears almost identical with last year's offering. Those two tail lights on the fin-like rear fenders are still very much in evidence. Nothing in design since the New Look has created so much comment. "They're different," they say. Painting your nose red will make you look different, too, but who wants to do it!

Take one McCahill (250 lbs.), multiply him by three and you have the width of Buick's front seat. And Brother, that's mucho space!

Photomontage by staff artist Hal Kelly

Inside, the dashboard has been changed back to the conventional handling of instruments: the '48 models had a large, circular arrangement around the steering post.

The new engine has a bore of $3\frac{13}{16}$ inches with a $3\frac{5}{8}$-inch stroke. This is a comparatively large bore and an exceptionally short stroke. Consequently, 12 per cent less cylinder wall area is exposed to explosive flame. Tie this up with the fact that at 4000 rpms, the piston travels only 2400 feet per minute as compared with the 3000 feet in former Cadillacs, and you will realize the tremendous saving from eliminated friction.

As a result, the engine runs far cooler

Here's the way Buick combines the smart, flowing lines of a convertible with sedan comfort. It's the steel-top Custom Riviera—built on a Roadmaster chassis. And it'll be in production this spring.

than previous models and the new Caddy now has an 18-quart cooling capacity as against the former 25 quarts. The entire engine is considerably lighter than former models, too.

When I say that Cadillac is America's finest car, it isn't a snap opinion. Recently, I made a survey of repair shops on some of our toughest roads and fastest speedways. I asked the repair men what they considered to be the best all-around American car. Cadillac was rated best eight times out of ten and it never came out worse than second!

These automobile mechanics see cars in action 24-hours-a-day, 365-days-a-year. And when they give a car the highest rating, both you and I can rest assured it really is tops.

OLDSMOBILE

In October we brought you a report on the 1948 Futuramic Olds which started a minor explosion. I implied that the Olds was dead on its feet. Letters from irate Olds dealers flooded the office. Some loyal Olds owners also hopped on the band wagon, shouting for my scalp.

Some weeks later, a telephone call came from an Oldsmobile executive. He said that he had read with interest Mr. McCahill's opinions of the 1948 Olds and would like to invite him to test a new '49 Olds which he might enjoy more than the previous model.

I did, and here's the result!

There is as much difference between the 1949 Oldsmobile Futuramic with its new V-8, 135-horsepower engine, and that 1948 job as there is between a Texas Jack-rabbit and a stuffed snail. The new Olds is pure dynamite! The added horsepower not only gives it the whip a car in this class should have, but has taken the roughness out of the Hydra-Matic drive. As my regular readers know, I have never liked Hydra-Matic—first, because I felt its action too draggy and slow compared to good manual shifting and, second, because of its shifting roughness. These faults have now been entirely eliminated. No driver in the world can shift manually as fast as the new Olds Hydra-Matic

The looks, though similar to the '48, are slightly different. The '48 was rated one of the best looking cars in the

Buick's boxy rear allows for more storage space in the trunk—it's big enough to hold tires upright and all your luggage. Even McCahill and his canine friend can fit. That's Tom on the far left.

country, but I feel the new car is even better. I like its appearance more than any other GM design. The stern is more boxy than before and this has added a lot to the trunk room—a point we took a swipe at in October. The front end now has two air scoops and a different grill design and in making this change nothing has been lost.

The new Olds engine is called the Rocket. To emphasize just how much it has improved in performance, let's compare stop watch figures between the '48 and '49. The 1948 Olds Futuramic from 10 mph to 60 mph took 18 seconds. The 1949 Olds from 10 to 60 took 13 seconds. This amounts to a full five-second variance or at least two city blocks on a getaway.

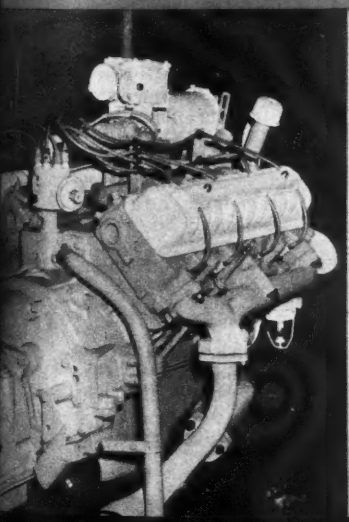
From zero to 60 on the 1948 (not originally reported) took 22.5 seconds. On the '49, from zero to 60 took 13.5. You will note that, with the increased power which now whips the car away with neck - snapping speed, it takes only one-half second longer to reach 60 from zero than it does from 10. This is due in part to the fact that it starts in low at zero and is in second at 10. Top speed? The Olds I drove hit 96.

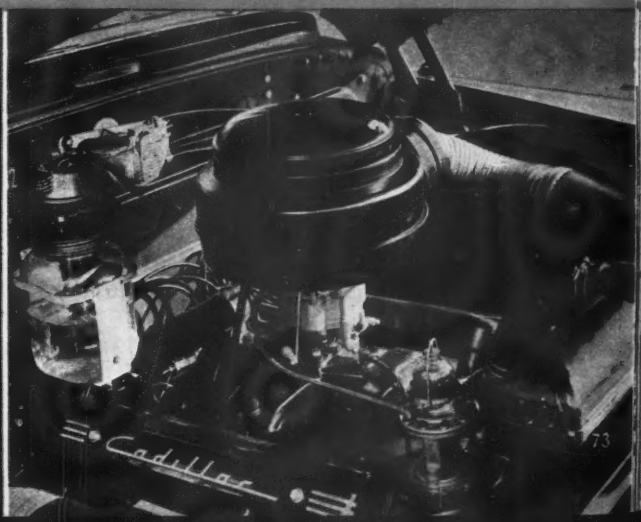
BUICK

Buick for 1949 has a number of improvements over the '48 model which make it a better car.

In appearance, it has a new rear with a nice big window for looking in back of you to see if any cops are coming. The rear fenders have been changed, too, having taken over some [*Continued on page* 153]

Tom checks the 135-hp V-8 engine of the '49 Olds, below left. Last year's model had only 115 hp. At the right is the 160-hp Cadillac engine with which General Motors may break the stock-car speed record.





Mr. Martin takes a craftsman's pride in his models as he contrasts his giant Mars to his frail pioneer "motor kite."

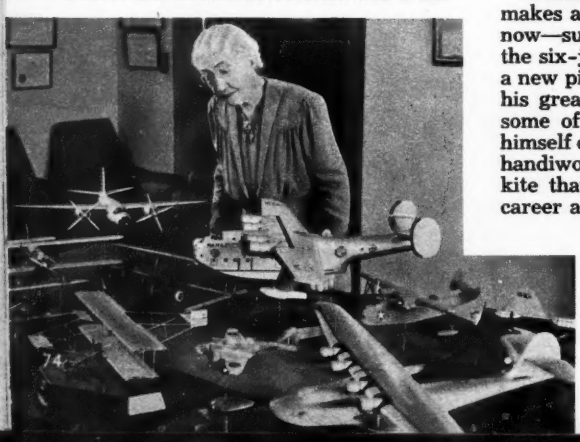
GLENN L. MARTIN—AIR CRAFTSMAN

NEVER can tell how a lad will turn out. Now look at Glenn L. (for Luther) Martin, biggest plane builder in America. At three years of age he dismantled a cultivator all by himself—or so the family story claims. But then, instead of sticking to farm problems and figuring out better ways to till the good earth, he went and flew a kite—and decided to make aviation his career.

One of the first kites he built was a tailless box that soared almost vertically and stood the kids on their heads with envy. Young Glenn turned his living room into a factory and produced three a day at 25 cents each—payable on the installment plan.

The first of the long line of Martin planes was a motorized version of this toy. In 1909 he took it aloft, becoming the third man in the U. S. to fly a self-made plane.

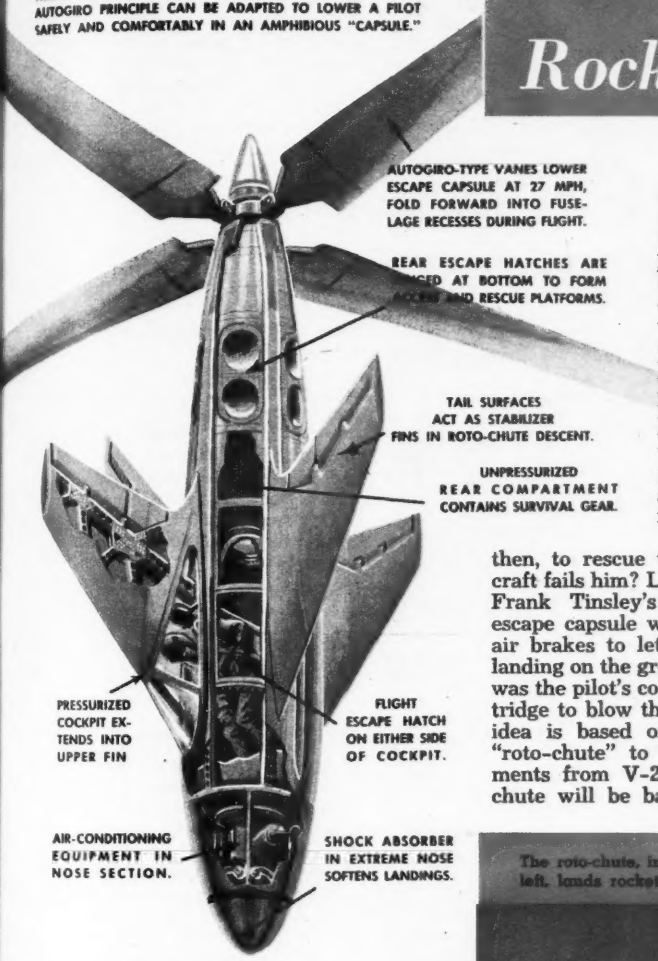
A master craftsman of the air, Mr. Martin makes a lot finer and faster "motor kites" now—such as the 200-foot seaplane Mars, the six-jet bomber XB-48 and Gorgon IV, a new pilotless ramjet aircraft. But he gets his greatest thrill out of showing visitors some of the 100 model planes he's made himself or collected—especially his favorite handiwork, the miniature of the big box kite that first flew him into his fabulous career as aviation's No. 1 air craftsman. •

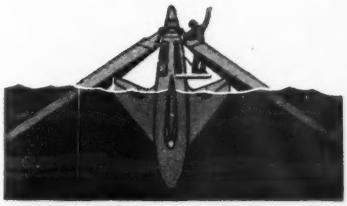


Mrs. Minta Martin, at 85, is still keen on her son's collection. She helped build—and fly—his first plane.

Roto-Chute for Rocket Pilots

G.E.'S NEW "ROTO-CHUTE" MAY PROVE KEY TO EMERGENCY ESCAPE FROM SUPERSONIC AIRCRAFT. DESIGNED TO RETRIEVE INSTRUMENTS FROM HIGH-ALTITUDE ROCKETS, ITS AUTOGIRO PRINCIPLE CAN BE ADAPTED TO LOWER A PILOT SAFELY AND COMFORTABLY IN AN AMPHIBIOUS "CAPSULE."





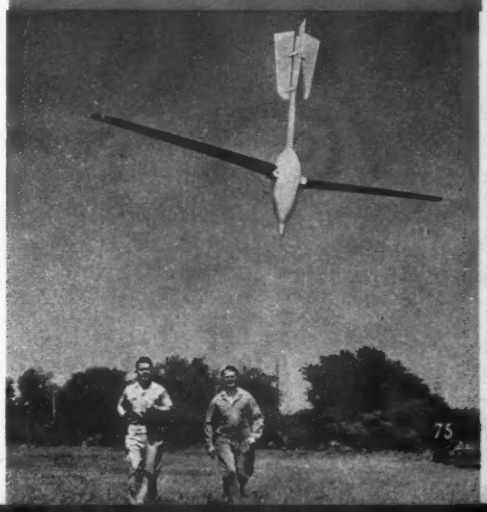
FRANK TINSLEY '48

LANDING AT SEA, THE CAPSULE FLOATS UPRIGHT LIKE A BUOY, STEADIED BY ITS FINS AND ROTOR VANES. FOOD, WATER AND SURVIVAL GEAR KEEP PILOT ALIVE UNTIL RADIO AND POSITION LIGHT BRING RESCUERS.

SUICIDE is the word for the pilot who tries to escape from a supersonic plane by parachute. The billowing fabric 'chute was a wonderful aerial lifesaver —till Air Force pilots started streaking faster than sound in rocket planes like the Bell XS-1. The impact of the air at such speeds is so terrific that it will not only shred the parachute like a burst of shrapnel but also peel the flesh off the pilot's bones.

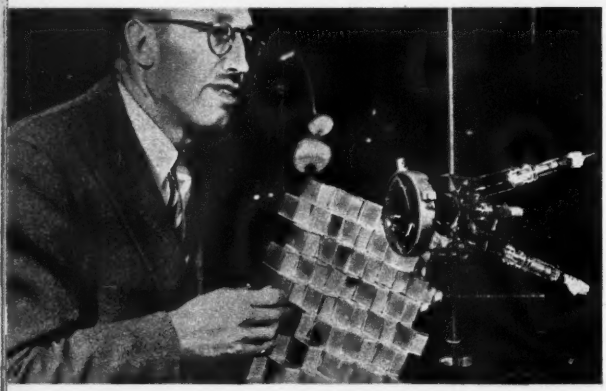
What can science do, then, to rescue the rocket pilot when his craft fails him? Look to the left, at MI artist Frank Tinsley's solution: a pressurized escape capsule with unfolding rotary-wing air brakes to let the flier down to a safe landing on the ground or at sea. The capsule was the pilot's cockpit before he fired a cartridge to blow the unit off to the rear. The idea is based on General Electric's new "roto-chute" to bail out research instruments from V-2 rockets. Soon, the roto-chute will be bailing out rocket pilots. •

The roto-chute, invented by G.E.'s I. B. Bensen, left, lands rocket instruments at easy 27 mph.

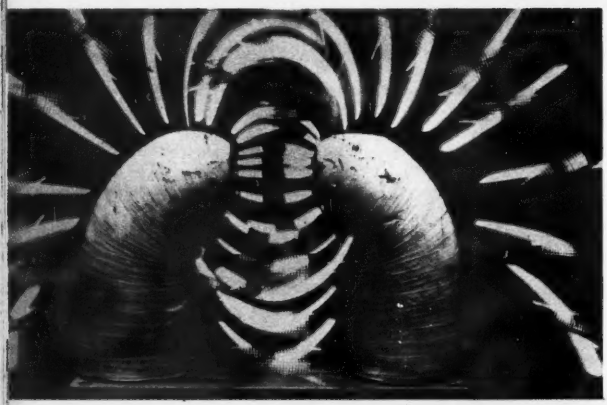


NEW in SCIENCE

Belly Pump is a German version of the iron lung. It's a compact, portable machine which provides artificial respiration in cases of polio, poisoning and drowning. Pictured here with a patient is Wilhelm Huebner whose workshop is expected to turn out about 25 of these life-saving medical devices every month.



Home Color TV is now a reality with the invention by Dr. Willard Geer. His new television tube reproduces true colors and is adaptable to your own set. The series of prisms, shown enlarged several-hundred times, fits into the tube's viewing screen. Three electronic guns bombard the prisms with impulses corresponding to the three primary colors, producing full-color pictures on your TV receiver.



Magnetic Pix: here's a shot of the paths taken by magnetic lines of force. The picture was made with the aid of a new electron tube developed at New York University. It shoots out electrons which emit a blue glow, thus tracing each line of force. Photo was made by a series of exposures with the tube in different positions.

Squirrel Cage for jeeps is this new device for travel over swamps, bogs, soft beaches and heavy underbrush. It's a continuous road matting on rollers which runs around the body and under the wheels. The Marine Corps is testing it at the Quantico, Virginia, base.

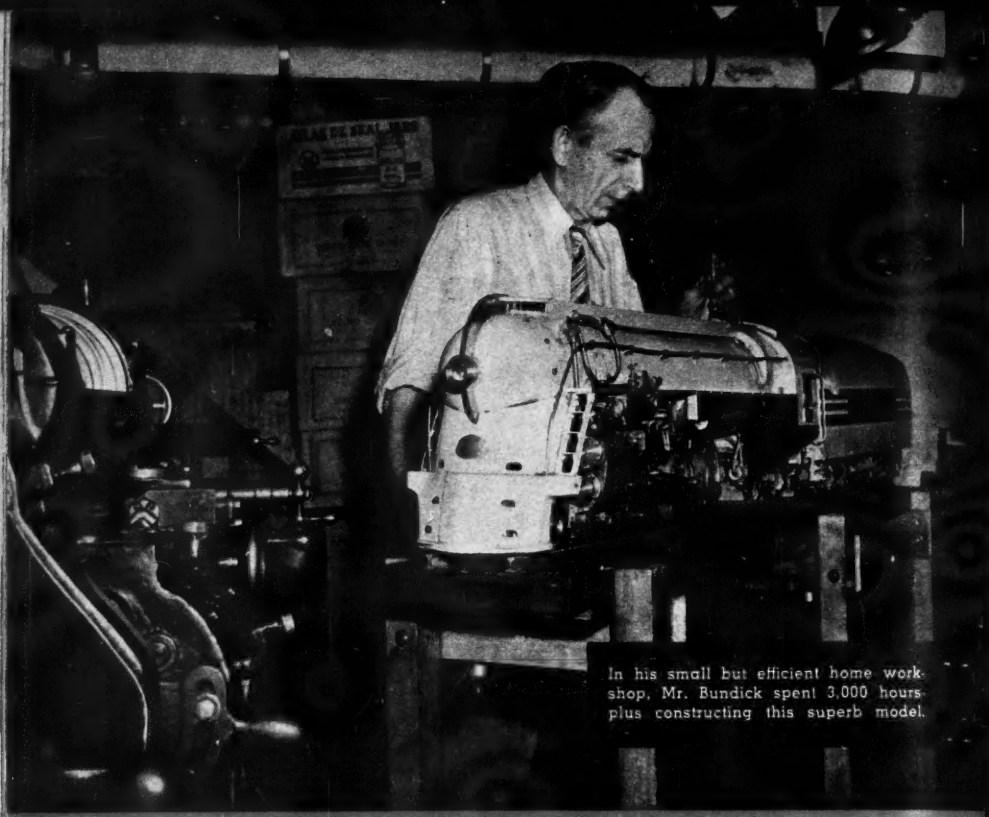
Assembly Line for Baby Hudsons

Plastic seats for plastic cars on Detroit's smallest production line. Hudson's making 20,000 for dealer displays.

Midget auto line looks like the real thing. These precision models are now being built to a one-sixteenth scale.

The tiny bodies are polished and painted. One-half is left transparent so that interior can be seen.

Plastic frames are hand-glued, perfect replicas of the actual chassis construction.



In his small but efficient home workshop, Mr. Bundick spent 3,000 hours plus constructing this superb model.

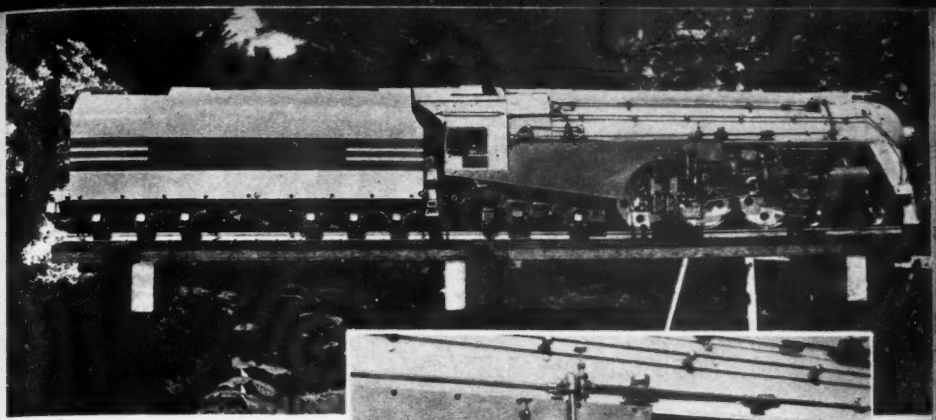
Model Maker's Dream Engine

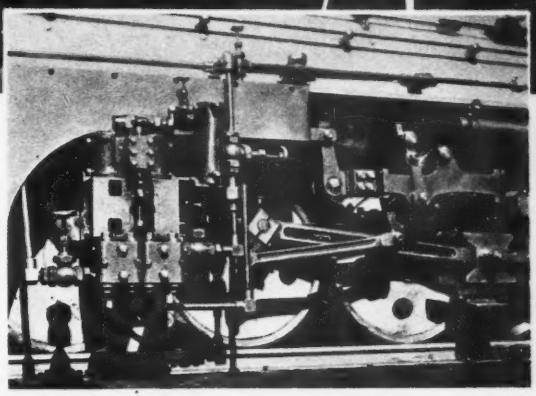
Meet Clarkson Bundick, skilled devotee of one of the world's most exacting hobbies—the building of scale-model, steam-driven replicas of locomotives that made our railroading history.

By Fred M. De Ripperda

DID you ever happen to see an apparently normal-looking man bend over a working scale-model steam locomotive, take a deep whiff of the acrid aroma of hot oil and soft coal being emitted from its tiny smokestack, and then murmur ecstatically, "Mmmmm-aaaah! Wonderful!"? You did? Well, friend, you were gazing at a Live Steamer, one of those curious craftsmen whose hobby is among the strangest and most fascinating in the world.

To the full-fledged Live Steamer, no smell is more alluring, no sound more melodious, no sight more thrilling than those produced by the miniature metal engine which he has created after months—sometimes years—of painstaking effort. In the truest and most flattering sense of the word, these fellows are "nuts"—and extraordinarily contented "nuts" at that. And the closer their models come to the real thing—in sight, sound, smell and per-





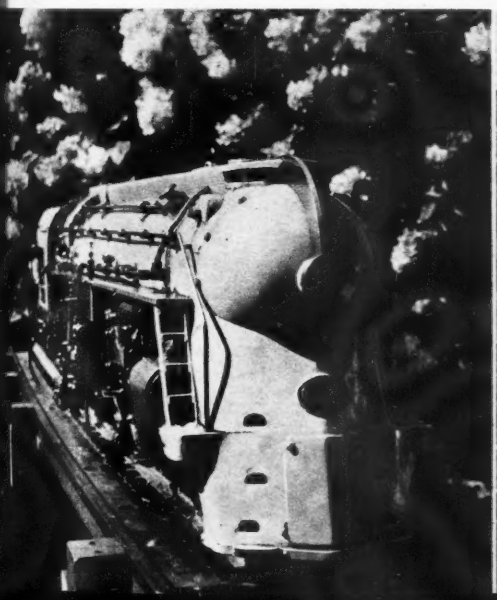
Intricate detail of the engine is shown in the close-up, right, of the tiny feed-water pump specially designed and constructed by Live Steamer Bundick.

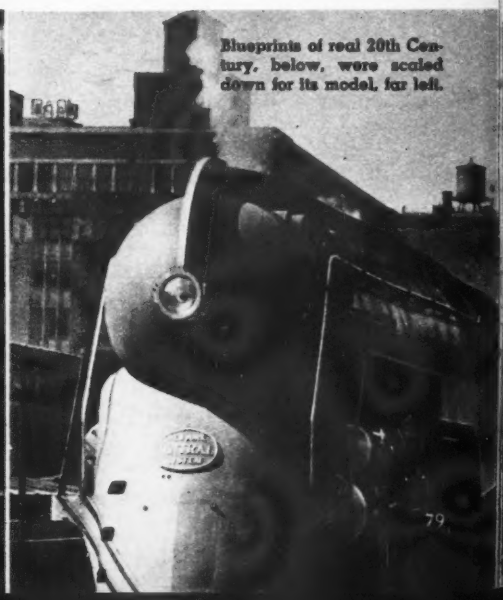
formance—the happier they are.

One of the most skilled Live Steamers I've met is a wiry, energetic fellow from Scarsdale, N. Y., named Clarkson U. Bundick, whose superb ¾-inch-to-the-foot working model of the New York Central's Hudson-type streamliner is pictured on the cover of this magazine. Mr. Bundick is a model engineer for the National Broadcasting Company. In spare evenings and during week-ends, over a period of eight months, he built with his own hands and tools every single item (except the steam pressure gauge) of the many hundreds that went into this replica of the engine which once pulled the crack Twentieth Century Limited between New York and Chicago.

How many hours did it take? Possibly 3,000, probably more. Mr. Bundick isn't sure. Live Steamers don't keep track of such an unimportant element as time when they are absorbed in their hobby. But a glance at the photos on these pages of the six-foot long, 400-pound locomotive and tender tells its own story.

The locomo- [*Continued on page* 138]





Blueprints of real 20th Century, below, were scaled down for its model, far left.

DO PREHISTORIC MO

MONSTERS STILL EXIST?

Future explorers may find themselves battling "extinct" creatures which lurk in the remote corners of the world.

By Willy Ley

Author of The Lungfish, the Dodo and the Unicorn*

DINOSAURS may roam the unexplored jungles of Africa!

Native tribes near the Congo River call the creatures Mokele Mbembe. They say they're enormous and live in caves washed out by the river at sharp turns. Some startled tribesmen have described them as having long necks, small heads and one long tusk. Others have told of a three-horned monster like that shown above, with ferocious teeth and a massive comb. All agree that the creatures kill both humans and elephants. But they never eat the

*The Viking Press, N. Y.

FRANK TINSLEY 48

flesh. Farther east in Africa, near Lake Bangweolo, the natives tell of a weird animal which they call Chipekwe. Because it kills hippopotamuses, not one hippo can be found in the lake. One tribe claims it hunted and killed a Chipekwe forty years ago. The strongest hunters had to jab it with their spears for days before the animal finally succumbed.

There have been many other reports of strange creatures still uncatalogued. They have not been officially described and not yet pinned down with a Latin label. But in all corners of the earth there are people who will swear to what they have seen.

Of all the unknown animals, the one for which the best evidence has been offered is the apeman of the South American jungles. In 1929, a French geologist, Monsieur de Loys, made a trip into the interior of Venezuela. One day he camped on the banks of the Catatumbo River.

Suddenly, two hairy creatures approached the camp in fury. As they attacked him he fired. One of the attackers fell dead, the other fled. When de Loys examined the body, he found it was not a man as he had thought—it was an ape!

He knew he had really discovered something because it had always been thought that there were no apes native to the Western Hemisphere. He propped the body up on a crate and took pictures. It was five feet tall, had 32 teeth, a nose like that of South American monkeys, and no tail at all. Then he cut off the head in order to bring home the skull. But a later accident to the expedition resulted in the loss of the skull although the photos were saved.

So far, this strange apeman of Venezuela has never been found again.

Tales of natives and explorers cannot be discounted. The famous African explorer, Stanley, and other early hunters were told about an animal living in the Congo which had stripes. It sounded like a zebra but since zebras live in open plains, the white men were doubtful. Later the animal was actually "discovered"—it was the okapi.

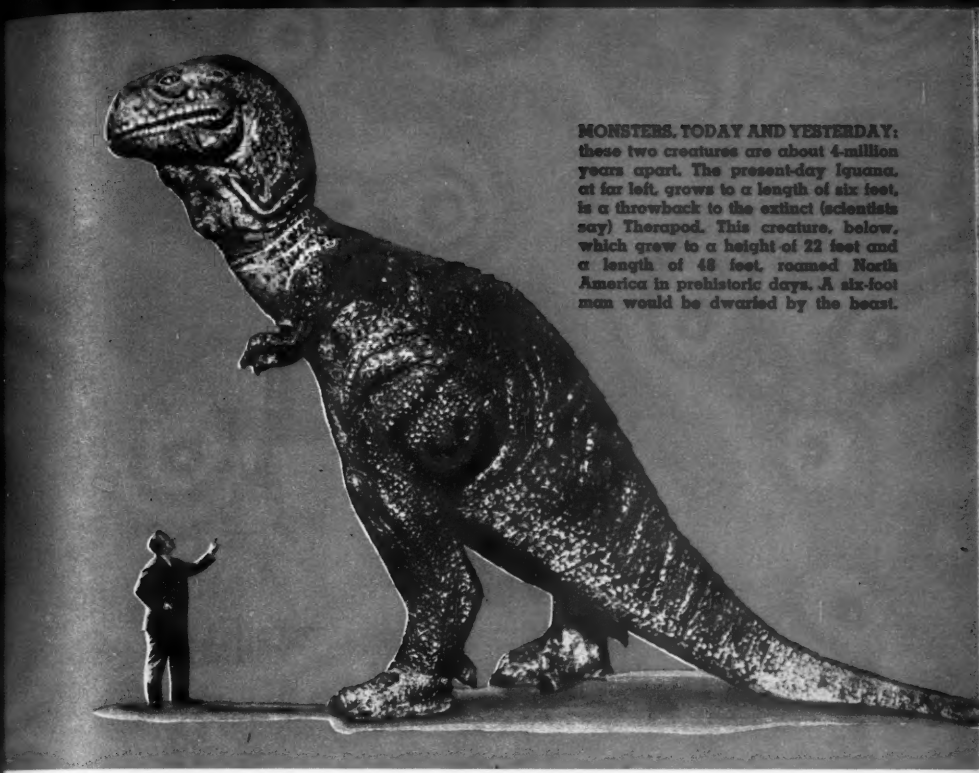
The natives also wore feathers in their headdresses which did not come from any bird known to science. Then this bird was "discovered"—the Congo peacock.

And in Liberia, German hunters heard stories about a very large black pig with treacherous teeth. They didn't believe them until one day a hunter was actually attacked by the animal—the pigmy hippo.

And the fishermen along Norway's coast have insisted for hundreds of years that two sea monsters exist. One, they say, looks like a long snake. The other has a head like the roots of a big uprooted tree. But the roots are alive and squirming—with two gigantic eyes. The first monster the fishermen call the Sea Worm and the second, Kraken.

Way back in 1861 the commander of a French man-of-war came back and told of an encounter with an 18-foot octopus of brick-red color. The crew shot cannon balls at it. When they hoisted it aboard, the creature decayed so rapidly it was thrown overboard.

The largest octopus ever taken had a ten-foot body, two long arms about 30-feet long and two short arms about seven feet long. Some varieties of toothed whales



MONSTERS, TODAY AND YESTERDAY: these two creatures are about 4-million years apart. The present-day Iguana, at far left, grows to a length of six feet, is a throwback to the extinct (scientists say) Therapod. This creature, below, which grew to a height of 22 feet and a length of 48 feet, roamed North America in prehistoric days. A six-foot man would be dwarfed by the beast.

like to eat octopus—and they don't seem to care about the size so long as they can swallow the creatures.

One such whale, on being harpooned, vomited recently-eaten food during its death struggle. In that mess, the men found a piece of octopus tentacle six feet long with a diameter of two feet. The diameter of tentacles of the biggest specimen previously seen had been only eight inches!

On the skin of another toothed whale, fishermen found the mark of a sucking disk two feet in diameter. The tentacle to which it was attached must have been even thicker. The octopus to which tentacles and sucking disks of this size belong, must be of enormous dimensions.

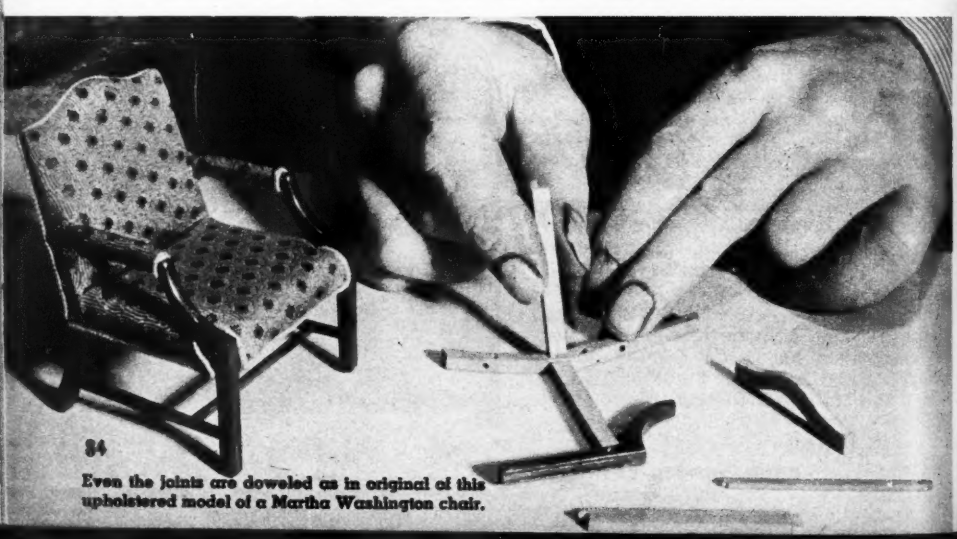
As for "ordinary" sea serpents—they have been seen on almost all shores at least 200 times. The latest case is that of the SS Santa Clara. This ship literally ran into one in the Gulf Stream at about noon on December 30, 1947. There was lots of blood in the sea and the captain of the vessel thinks his ship may have cut the animal in half.

There are other unrecognized creatures of the sea, too. A turtle-like monster has been reported on Easter Island and in Queensland. It's called Nuihi on Easter Island and Moha- [*Continued on page* 144]

This is an ancient engraving of the Kraken—a ferocious sea serpent with squirming tentacles and two gigantic eyes which supposedly preyed on Norwegian sailing vessels off the Scandanavian coast.

Master Micro-Carpenter

Model-maker William Kautter is custom builder to the nation's furniture fanciers. He turns out superb vest-pocket replicas of priceless antiques.



Even the joints are doweled as in original of this upholstered model of a Martha Washington chair.

By Louis Hochman

BUSINESS was *too* good!

When William Kautter was a cabinet maker in the "old country" he followed all the local customs of the trade. One of them was to build small-scale models of a proposed piece of furniture to show the customer. If approved, he would start building the full-scale product.

Business boomed and Kautter found himself spending most of his time on models. And before long he had become a master model-builder as well as a master-carpenter. Soon, he switched completely to models and now makes his living in this country selling only his superb replicas.

Kautter uses no nails in his models. They're all doweled and glued like their full-scale counterparts. Even if there's a hidden dowel in the original, Kautter puts it into the model. As a result, his tiny pieces of furniture have a strength which belies their fragile appearance.

Accurate down to the last detail, Kautter even duplicates the original hardware by fashioning hinges, drawer pulls and catches from sheet brass and wire. Tiny doors on grandfather clocks and china closets swing open on delicate hinges, drawers pull out freely, spinning wheels turn, and tiny grandfather clocks tick away accurately.

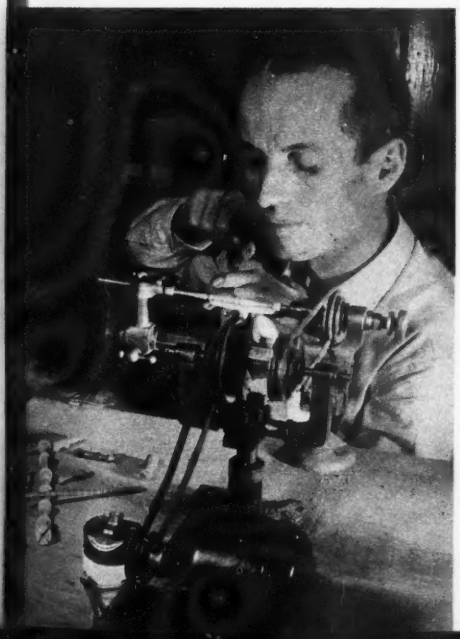
In keeping with his miniature production are the miniature quarters in which Kautter conducts his business. Cramped for space, his workshop is condensed into an 8 by 10-foot area behind his store. The store itself is so tiny that customers have to stand in single file, no more than three at a time. He utilizes every available inch of wall space—even the cubby hole marked "Gents," which he has lined to the ceiling with shelves.

Kautter's power tools include a drill press, wood turning lathe, router, shaper and jig saw. He has an 8-inch circular saw table for which he had a special 1/32-inch saw blade made for inlay work.

Scorning mass production, he rarely makes up more than six copies of a single piece at a time. It takes him about four days to make the $145 grandfather clock and three days to turn out a Queen-Anne style china closet which sells for $30. A fully upholstered Chippendale chair, which sells for $32, takes him two days to build—six hours alone for the upholstering.

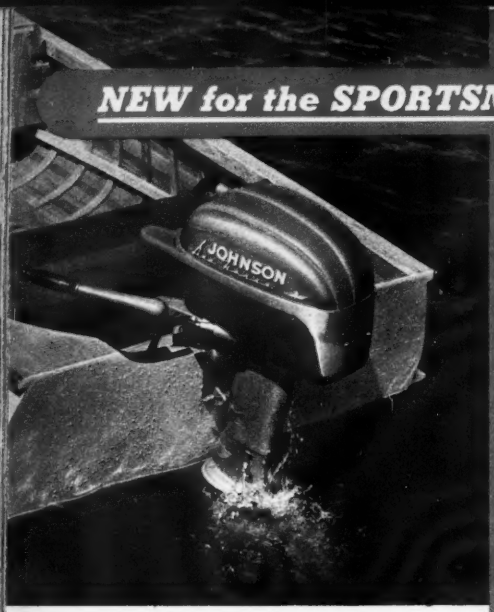
But all this painstaking and time-consuming work seems to be fun for Kautter—he says he relaxes at his job. Even now, he's making plans for larger working quarters—so he can turn out tinier models. •

Old-fashioned jeweler's lathe serves Kautter well. Some single pieces take almost a week to produce.



Grandfather clock, left, is built to a 1½-inch scale; Queen Anne closet, right, to a one-inch scale.

NEW for the SPORTSMAN



Gear-Shift Outboard has control for neutral, forward and reverse. Note photo of stationary rowboat with the motor idling. This model also has a separate fuel tank with a 12-ft. connecting hose. Made by Johnson Motors, Waukegan, Illinois.

Sled is a combination ski-and-sled device designed as a ski-trainer. Handlebars are to aid balance; foot controls work the brakes which are also used for steering. Skedding is fast becoming popular. Poloron Products, New Rochelle, N. Y.

Convertible Reel casts like a spinning reel but retrieves like a conventional model. Lever unlocks the reel seat and reel swivels through 90°. Casts extremely light lures and lines without backlash. Made by Lou Meyer Co., Kenosha, Wisconsin.

Hand Warmer for sportsmen and cold-weather fans operates on cigarette-lighter fluid. Special wick glows but doesn't burn when lighted, supplying heat for many hours. It's safe, too. Keep it in glove or pocket. Aladdin Labs, Inc., Minneapolis, Minn.

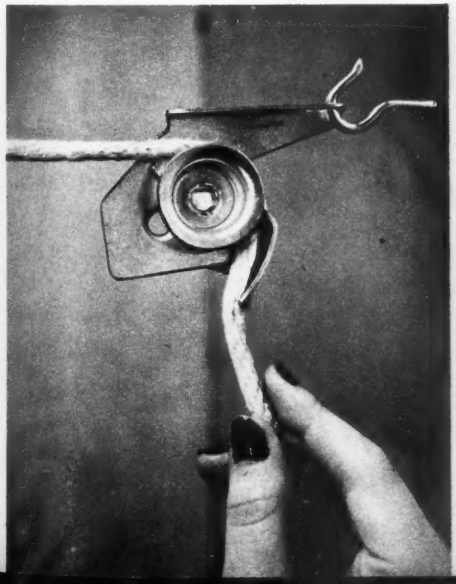
NEW for the HOME

Pre-fab Frames: here's your chance to hang that favorite unframed print. It's a kit which contains all the materials you need to make your own picture frames. G. E. Watson Co., 164 W. Lake St., Chicago.

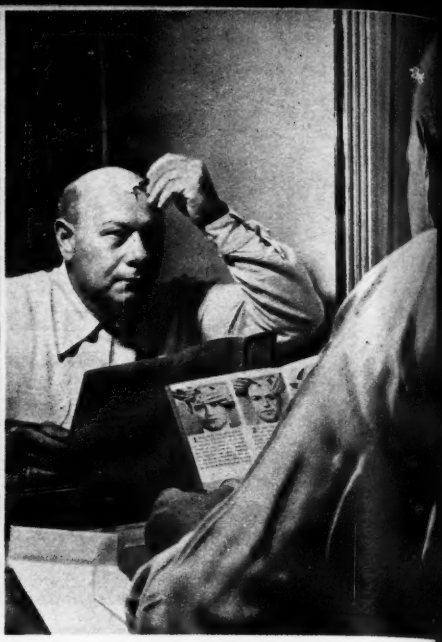
Robot Time-Switch makes all types of electrical appliances operate automatically. This electric servant not only turns 'em off, but on as well. Miller-Harris Instrument Co., Milwaukee, Wisc.

Sagging Lines? If a loose clothesline is your Monday problem, here's a fastener which will tighten and lock it all in one movement by pulling down on the line. Hall Industries, 11 W. Jackson Blvd., Chicago.

Micro-Radio is a tiny portable which runs on a pen-cell and a hearing-aid battery. You clip the aerial to a radiator or lamp and plug earphone into your ear. Micro-Electronic Products, Peru, Ind.



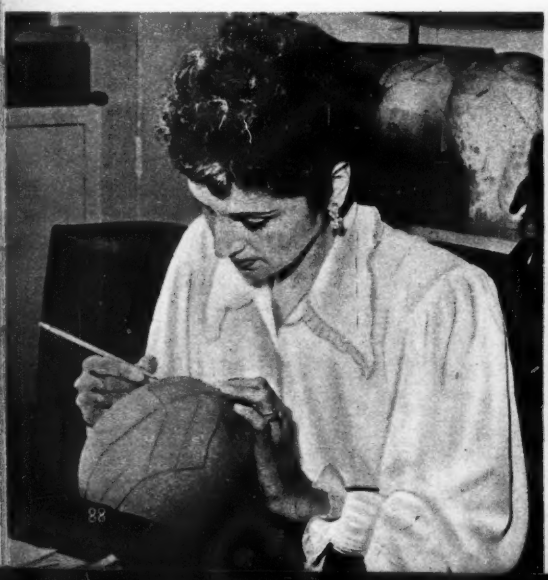
1 Bashful about that shining pate for years, Milton Jones gets mail kit to order hair.



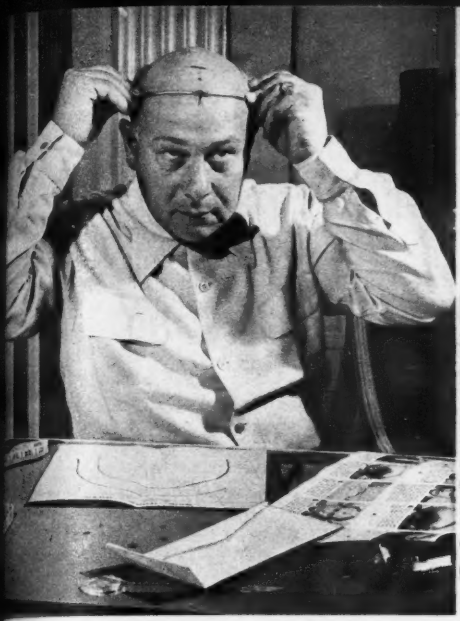
2 Following Max Factor's instruction booklet, Milton x-marks a spot for his new hairline.

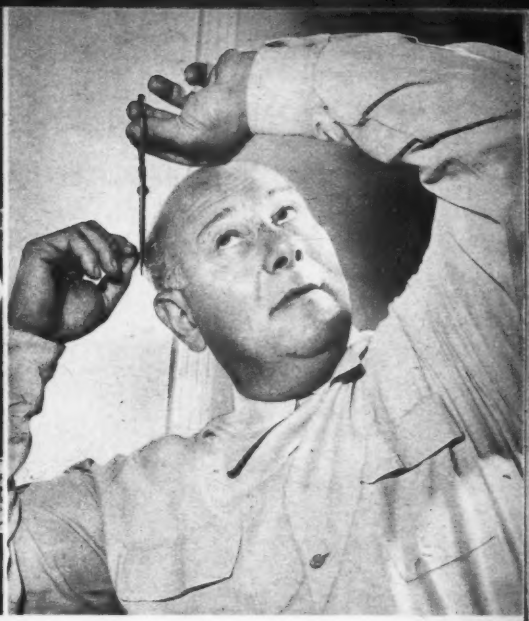
Hair Mail Special

5 Milton's mail order is put on a properly shaped hair block at Factor's wig workshop.



6 The wig dresser combs out the toupee to see that every hair looks like the real thing.





3 Then he stretches a wire across his head to get the natural dimensions for a hairy top.

4 Not much business for the barber, but Jones still finds hair he can clip for a sample.

Baldness beating you down? Don't lose your head—mail-order a scalp from Max Factor, movie makeup man—and brush your troubles away!

7 The postman brings the toupee and Milton rushes to a mirror to try on his new hair.

8 That handsome head of hair puts Milton in "top" shape for big business at his office.

A MONEY-MAKING

idea

I'm a Mail-Order Cabinet Maker

By Al Grossman

Owner of The Wood Market

"JUST cut the pieces for me," the musician urged. "I can put it together."

I wanted to throw the man out of my custom-built furniture shop. He wanted a coffee table made to his own design but squawked at my $30 price. He insisted he couldn't afford it—and I felt I couldn't afford to waste my time on people with picayune pocketbooks.

To get rid of the musician without hitting any high notes, I quickly detailed the pieces. Before I finished that little job, though, I had dreamed up something new in cabinet making. That man had nagged me into a business which, in the two years since then, has won me friends and customers all over the country.

Now, I make no more custom-built pieces. I do just one kind of work: I help people who aren't wealthy to make their own furniture.

I never even see 90 per cent of my customers. They write to me at my shop, The Wood Market, in Mount Vernon, N. Y., from Wyoming, Minnesota, the South, New England—and even from Denmark and Greece. They send me sketches and specifications for the furniture they want. I tell them how much it will cost for my part in it—the prefabricating—and I ship them the pieces all ready to put together.

When I first launched my prefabricating business in 1946, I got most of my jobs right in my own neighborhood—simple stuff like bookcases and record cabinets. Then I got additional customers from

word-of-mouth advertising, and people began to mail in sketches.

That gave me the mail-order idea. I started promoting cabinet making by mail through one-inch magazine ads. I was amazed at the number of inquiries I got from a few small ads.

My start wasn't a shoestring affair, though some of my well-heeled business friends seemed to think it was. I had $1500 in cash, three saws—radial, table and jig—, a drill press and some hand tools and clamps. And I had to do everything myself—from sweeping up to wrapping the prefabs for shipping.

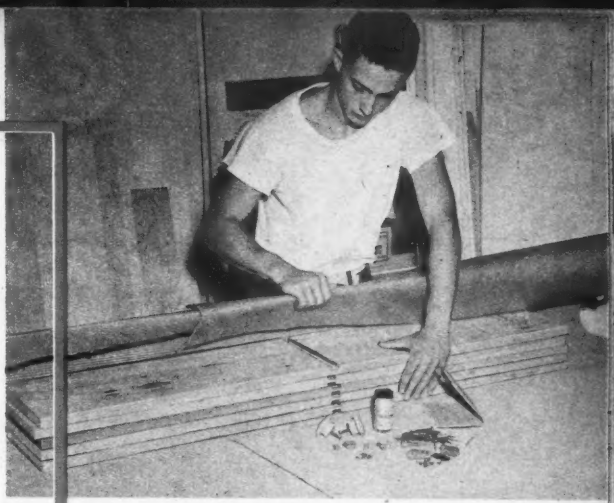
But even prosperous businessmen no longer consider my money-making idea a shoestring venture. I have the most complete shop I could want now, including a new shaper and a $500 borer. I have two craftsmen working for me full time, and I'm breaking in a third as an apprentice.

It's really simple to prefabricate furniture. After all, there are just two types of cabinets, an open case and a closed case. The rest is nothing but decoration. It may sound like heresy, but each piece of furniture is merely a box. So, the only problem in prefabricating is how to fit out the interior, the shelves and so on—and to find the best way to join the pieces.

After some trials (and a few errors), I've decided a dado groove is best for prefabricated furniture. It's a good joining, and it's much simpler for an amateur to fit together than tongue and groove, or mortise and tenon.

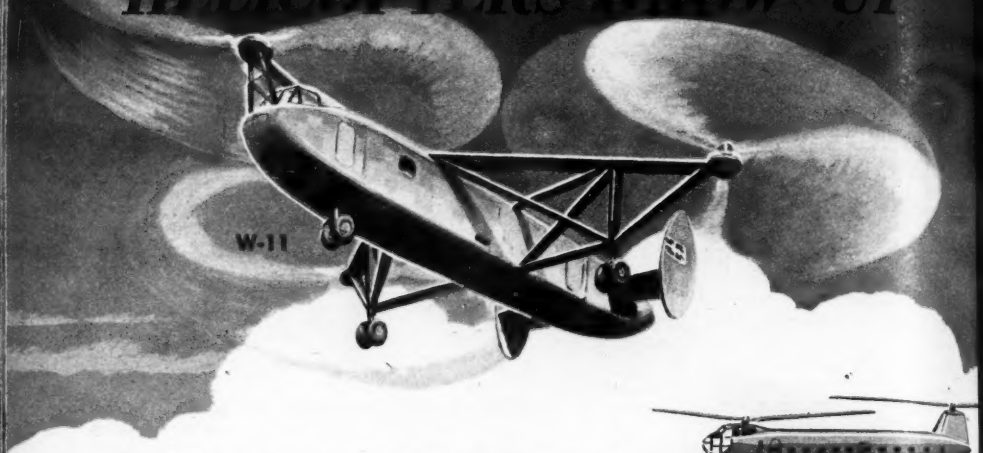
Now I use a precision-cut dado joint for most of my pieces. I rabbet the rear edges of every cabinet to receive the plywood back flush at the surface. This setup also makes the assembly of the pieces a lot easier. When the design calls for doors, I ship them out hung on frames and ready to attach. I have all the pieces well sanded and ready for stain or paint.

Then, before I wrap up the detailed [*Continued on page* 140]



STORY OF A BOOKCASE: Al Grossman, at the table saw on the opposite page, cuts up a plywood panel for the back of a mail-order bookcase while his assistants cut and sand the shelves. Glue, hardware and sandpaper, above, get packed with the pieces. Below, here's the case, all assembled.

HELICOPTERS GROW UP



YESTERDAY'S fragile, single-seat helicopter is fast becoming a revolving-wing giant!

The largest specimen yet to fan its way into the skies was unveiled recently at the British Aircraft Constructors' show at Farnborough, England. It's the Cierva W-11 *Iron Horse,* with three rotors driven by a single Rolls-Royce Merlin engine.

But we're going to beat that! On the planning board of our Piasecki Helicopter Corporation is a pinwheel to end all pinwheels. This XH-16 is twin-rotored and all metal, as large as a DC-4, with a detachable freight or passenger carrier comparable to a Greyhound bus. The passenger capacity has not yet been revealed, but it is estimated at 50 military or 70 civilians.

The passenger cabin attached to the craft's belly can be replaced quickly to speed up loading and unloading operations. Its most efficient use in war will be as an air ambulance.

When will it fly? In two years, Piasecki says.

Cierva W-11, top of page, now is world's largest, but Piasecki XH-16, bottom, will carry about three times its freight load.

MAGNETIC SOAP HOLDER

EVERY time Urey Edger of Louisville, Ky., washed his face he got in trouble. Not bad trouble—nobody was killed or clapped behind bars. But trouble enough to make him squeeze up his face tight, hop blindly around the washbasin and holler for a towel, to wipe that stinging soap out of his eyes.

Urey noticed a messy jelly in his soap dish and thought that some of his soft-soap goo might be smearing into his eyes and causing his face-washing woe.

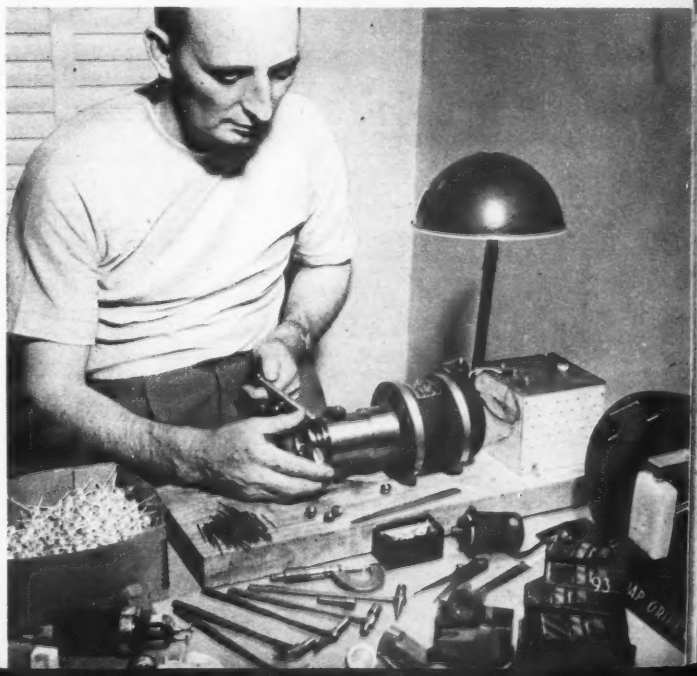
"Eliminate the soap jelly," he reasoned, "and I won't get soap in my eyes."

He was tired, too, of groping about the bathroom for a missing bar of soap, then slipping on it in the shower. He made up his mind he would figure out a way to park his soap high and dry.

After tinkering with the idea in his workshop, he set up a grooved magnetic holder on the wall to grip the ball-headed, notched pin stuck in the soap. Not only does the soap hang where it's handy but it dries quickly in the air without jellying and so saves 40 to 60 per cent on each bar.

For getting soap in his eyes once too often, Urey is reaping a fine reward—$50 for February's neatest gadget and a brand-new soap-holding business. •

Inventor Edger works in his shop to notch metal stems for his soap holder (see arrow).



WIN $50

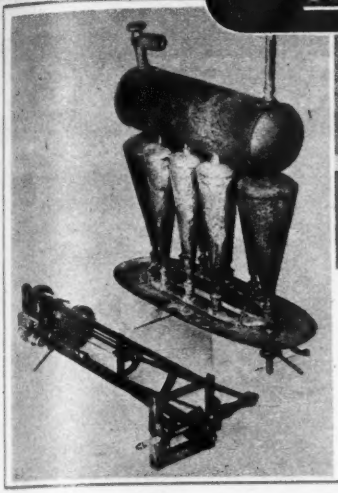
Dreamed up a neat gadget? If you're pretty keen about that pet project of yours, get busy and work it out in your shop. Then send pictures and a description of your invention to Gadget Editor, MECHANIX ILLUSTRATED, 67 West 44th Street, New York 18, N. Y. Each month the best entry, in the opinion of MI's editors will be awarded a prize of $50 in cash.

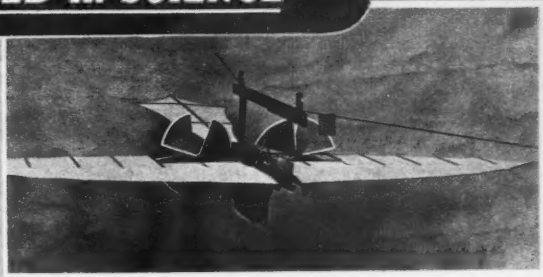
Farm-Boy Inventor

Puzzled! Jimmie's automatic door opener for the hen house isn't working, but he'll have it fixed in a jiffy. His new milking method, below, saves the farmer 87 days a year, 176 miles walking.

SOME of America's greatest genius is farm-bred! The latest example is 15-year-old Jimmie Sutherland of Windsor, Missouri; he's the Westinghouse scholarship winner in the 4-H Better Methods Electric Contest. His model farm, scaled ½ inch to a foot, is completely electrified and amazes professional engineers. Light bulbs were taken from an old pin-ball machine; grass is sawdust sprayed with green lacquer. All of his farm gadgets are made with parts improvised from war surplus material. He's built a tiny fig-barrel radio, an automatic timer for chicken-coop lights, a super electro-magnet. •

OLD in SCIENCE



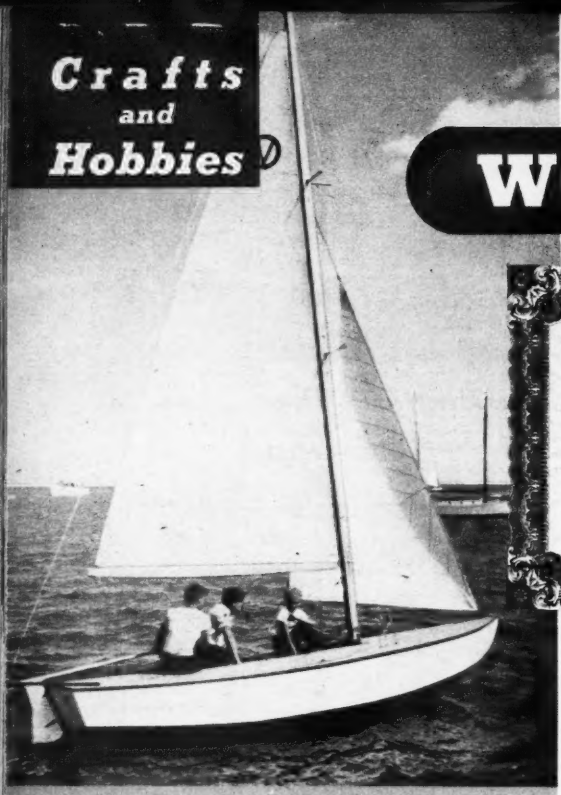


Steam-Engine Plane was built in 1848 by airplane-pioneer John Stringfellow. The model monoplane was equipped with two pusher propellers and a tail plane but no rudders. The steam-driven craft, above, flew 120 feet that year and its engine and boiler, left, won a $500 prize in a British competition.

First Sub? This cigar-like underwater craft was pulled out of Missouri Lake in Colorado after resting peacefully on the bottom for half a century. It's 20-feet long, 15-feet around the middle and is towed by a horse on shore. Built in the '90s by R. T. Owens, the submarine has a wooden frame with sheet-iron plates. Legend has it that eccentric Owens built the sub just to prove it could be done and then sank it.

Whale Rocket: Bazookas aren't new; we had them way back in 1865 as this handbill will show. Note the similarity in design (with a face shield) and in method of firing from the shoulder. It was called a Whaling Gun and fired a rope-carrying harpoon by means of an explosive charge in its tail. Its inventor promised instant death to any creature struck by the weapon. It must have had a weakness somewhere, however, for it never came into prominent use among the old-time whalers.

WORKBENCH



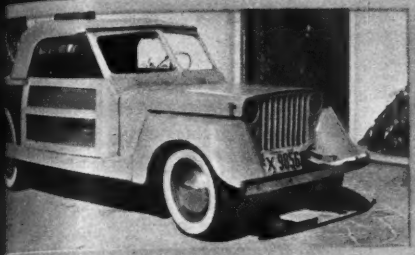
Above: Recognize this boat? It's William Crosby's Victory design (MI plan No. B-145, $3.00) and was built by Kenneth Graetz and his son of Milwaukee, Wisconsin, in only four months of spare time. Below: That one need not build a project from an MI plan to win a Workbench Award is proven with the "before" and "after" photos of a fine workshop job on an old Victrola cabinet by Robert Reith of Jonesboro, Indiana. The old top was replaced with a flat one, the sides trimmed straight and the legs cut off and replaced with a square base. The "new" cabinet now conveniently houses a dozen record albums and about two hundred loose records. Plus our Workbench Award, of course!

THE eight photographs presented on these pages represent the effort of typical MI readers who have completed a project of which they are —and justly too—quite proud. Each reflects the patience and ingenuity of the owner, to whom we have forwarded our Workbench Award plus a five dollar check.

In response to an avalanche of letters asking us to print more photos of actual projects built by MI readers, each month we will publish a selection of outstanding workshop accomplishments – your projects. If you have never competed for a Workbench Award then why not send us a few good photos plus fifty to one hundred words describing your boat, model, house or other homemade creation? Even if you've won a prize in the past you can still compete for another providing the project is different. If your entry is chosen as one of the best for the month, it will be featured in a future issue of MI. You will, of course, receive the attractive Workbench Award pictured above plus a five dollar check. After each monthly judging, entries will be returned providing sufficient return postage is provided. Address your entry to:

MECHANIX ILLUSTRATED
Workbench Awards
67 West 44th Street
New York 18, N. Y.

AWARD WINNERS...



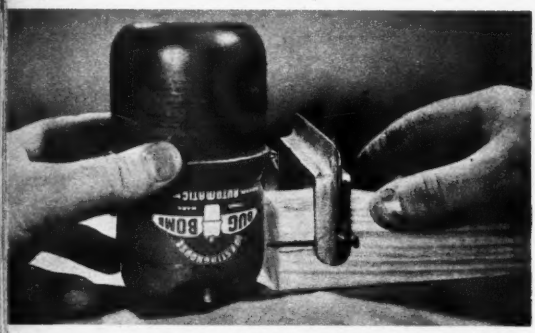
That's not a Jeepster above but a slick reconversion job of a surplus Jeep. R. M. Wieting of Honolulu, Hawaii, engineered the project which features an automatic raising canvas top. The new body added only 350 pounds to the original weight.

Roland A. LaFleur of Malden, Mass., built the 12-ft. Flyer pictured above (MI plan B-142, $2.00). Mr. LaFleur writes: *"It is hard to describe how thrilled I am, as this little boat is now the envy of all the neighbors."* And the Mechanix Illustrated editors.

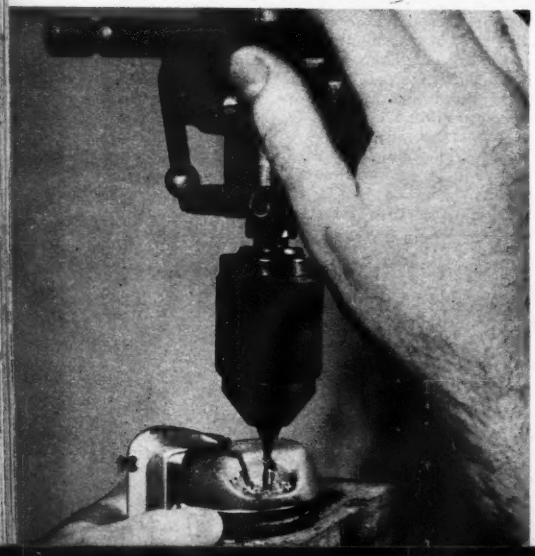
Above: One of the most popular boat designs ever published by MI was Bonnie (MI plan No. 944, $3.00). Claude G. Pike of Buena Park, California, built this job for about $350. And we know you couldn't buy a similar job for ten times this figure! Below: Model fans should recognize this authentic scale model of Mr. Mulligan (MI plan No. 374, 50 cents). Builder Joseph Voytko of Lakewood, Ohio, writes: *"I find this model very stable and it looks just like the real plane in flight. At present I have a file of MI model plans which I plan to build. Keep these plans coming. They are tops."* Glad you like our plans Joe—and we'll keep them coming.

Above: Hugh Barclay, 13-year-old newsboy from Ontario, Canada, built this 9-ft. Skippy boat (MI plan No. B-148, $2.00). Hugh writes: *"It took me two and a half months to complete, using mostly hand tools, and is the first boat I have ever built."* Nice going Hugh, and let us know which project you plan to tackle next. Below: One of the most popular model boat designs ever to appear in MI is Bouncie (Plan No. 388, 50 cents), and one of the best renditions of this model we have ever seen is being held by builder Charles W. Pinner of West Orange, New Jersey. The job is complete in every detail, including red leather upholstery.

POWER BUFFER



Above: To scribe the cutting line accurately on the empty aerosol bomb, improvise a marking gauge from a piece of scrap wood, a clamp, and a nail. Below: Clamp the gear-case assembly and the motor front-end plate accurately together; then drill, using a 10-24 tap, for the two mounting screws.



Here's a tool that no car owner, workshop fan, or furniture-proud housekeeper should fare without.

By Ken Murray

ONCE you hold this power buffer in your hand and test its speed, balance, and versatility, you'll agree that it is practically an indispensable tool. Used on your car, it'll zip a wax application from dullness into unsurpassed brilliance in an instant. In your workshop, you can substitute sandpaper for the lamb's-wool bonnet. And the furniture-proud housewife will quickly grasp its possibilities, too. All this for less than $20, with brand-new parts, including the motor!

Where specific trade names are mentioned, they refer to the actual products used in the original buffer. There are, of course, other brands, equally as good, available. An L & R Special Universal Motor (L & R Mfg. Co., 577 Elm St., Arlington, N. J.) is just the right size and can be purchased by mail for $15. This is a 1/10-hp. a.c.-d.c. job with precision ball bearings. The 5 or 6-in. flexible rubber disk and polishing bonnet can be obtained from the Jonrich Co., 112 W. 42nd St., New York 18; and the gears, Oilite stock, and thrust bearing, from the Boston Gear Co.

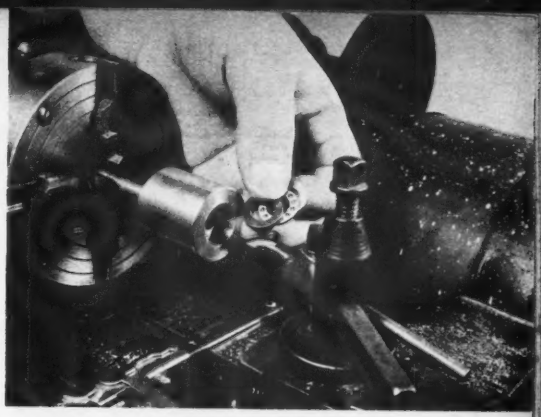
The gear housing is cut from a used Westinghouse "Bug Bomb" insecticide container. Scribe and saw a 29/32-in. section from the operating end. When sawing, follow the marked line exactly, as the driven

gear and shaft would be out of line if the cut wasn't square. Drill off the release-vent nipple and snip off the curved bit of tubing at the opposite side.

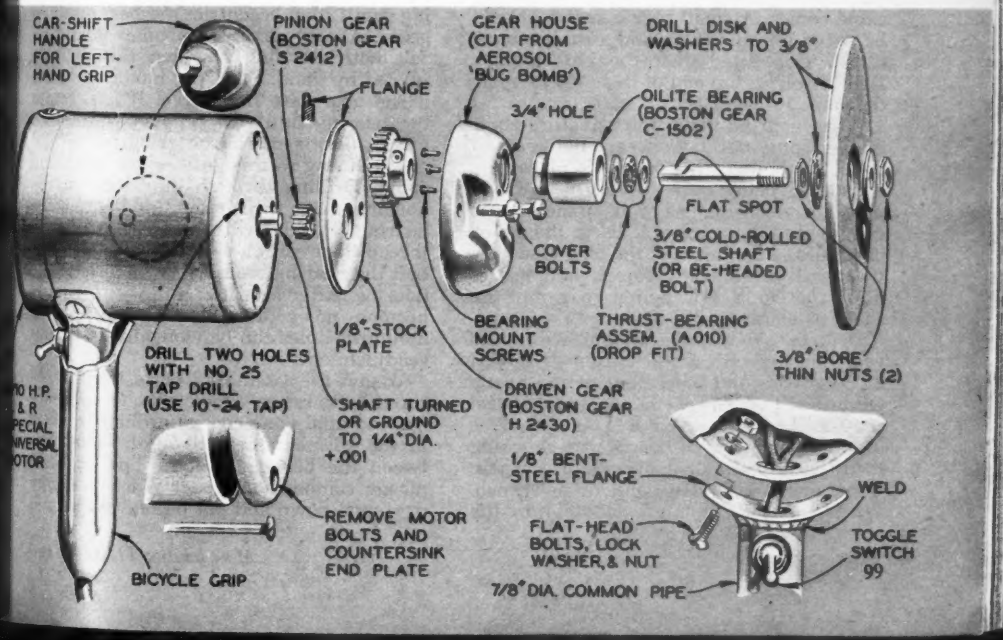
Take the motor, unscrew the two exposed bolts, and lift off the end plate. Since the gear housing will seat against the curved face of this motor plate, it must be sealed with a flanged metal disk, as shown. This disk is drilled so it can be slipped over the pinion gear that goes on the motor shaft. Accurately position the gear housing and disk on the motor plate and drill two .1495-in. holes to take the cover bolts. A 10-24 tap is used to thread the motor-plate holes.

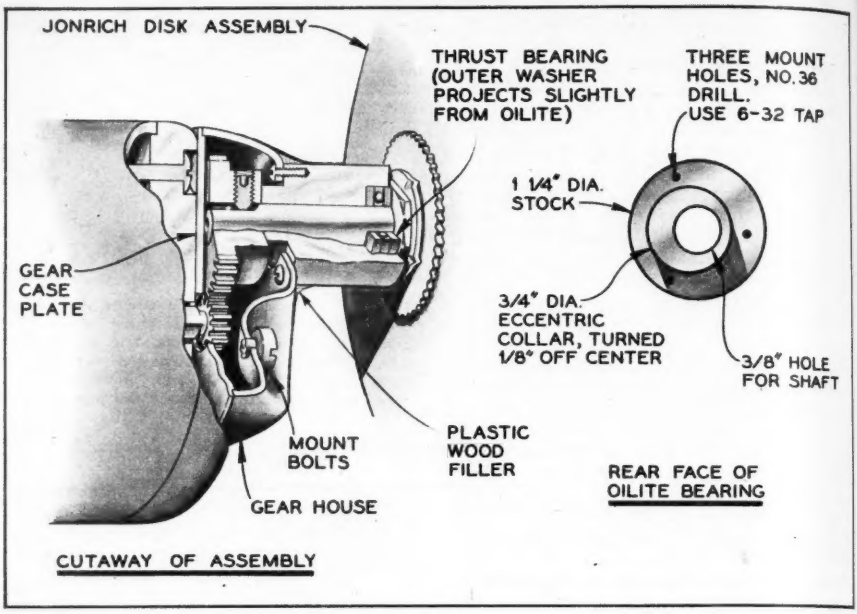
The combined shaft bearing and thrust-bearing mount is made from No. C-1502 Oilite bar stock. This is already cored and is a drive fit on a ⅜-in. steel shaft. Chuck it in your lathe and turn it down to 1¼-in. dia. In case a lathe is not available, it is possible to hold the work in the chuck of a drill press and cut it to dimension with a file. A drop-fit recess is next bored in one end for a No. A 010 thrust bearing. The outside washer in the thrust-bearing assembly should project slightly from the recess. Turn a ¾-in. dia. eccentric on the opposite end of the Oilite bearing, about ⅛ in. off center. This affords an accurate means, later, of meshing the two gears to working tolerance.

Now turn back to the motor. Lift out the armature and pry off the rear plate, which houses the brushes. One of the brush connectors must be lengthened with a bit of insulated wire so the connections can be reversed to change direction of rotation of



Above: A drop-fit recess is turned in one end of the Oilite bearing to take the thrust bearing. Below: How the handle is secured to the housing of the 1/10-hp. motor. Note the position of the simple on-off switch. The bicycle grip, shown at left, is added after assembly to cover the pipe handle.





the motor and cause the buff to rotate to the right. This operation can be passed over if you do not mind the buff seeming to run backward—efficiency is the same in either direction.

Make the handle from a 4-in. length of ⅞-in. o.d. pipe, screwing or welding it to a flange bent to fit the motor. Bolt this flange over the opening from which the motor cable comes. A small toggle switch should be wired into the cable and a rubber handlebar grip fitted over the pipe handle. Drill a hole in the end of this grip to allow the cable to pass.

Turn or grind down the armature shaft to ¼ in. plus .001, taking very light cuts to avoid springing the shaft. Replace the armature, being sure to return the two precision bearings as you found them; countersink the original holes in the motor end plate so the heads of the long assembly bolts will no longer project; and gently drive the No. S 2412 pinion gear onto the shaft, as shown.

Drill the ¾-in. hole in the face of the gear housing with a hole cutter—it should fit closely around the eccentric end of the Oilite bearing. The ⅜-in. cold-rolled-steel shaft is threaded at one end. It should be forcibly run into the bearing by chucking it in the lathe or drill press and grasping the bearing with one hand or a wrench. When the shaft rotates smoothly in the bearing, remove it and file or grind a flat spot on the unthreaded end for the setscrew of the No. H 2430 driven gear. If this is not done, the setscrew will leave a burr, which will scratch the bearing each time it is passed through for assembly.

You can now apply a little gear lubricant and assemble the housing and the motor for a short test run. Rotate the Oilite bearing until the eccentric meshes the two gears. A very slight bit of play should be felt with the fingers when the shaft is turned by hand. Start the motor and note if the gears are noise-free. If not, rotate the bearing until the quietest position is found. Scribe marks on the bearing and gear housing so this position can be found again. Drilling through the inside of the housing, make three mounting holes in the bearing shoulder with a No. 36 drill; then thread them with a 6-32 tap. You can now bolt the bearing securely to the face of the housing. After long use, if the gears should become noisy from wear, the housing mounting holes can be elongated to permit readjustment.

To give the assembly a perfect, manufactured appearance, wipe off the Oilite bearing and apply one coat of ordinary shellac to the surface; then fill in the joint between the bearing and the housing with plastic composition wood. When perfectly dry, sand down and put on one coat of red

wrinkle enamel. Wrinkle enamel in either black or red is available from Craft Finishes, Box 467, Arlington, Va. It is the same material commonly used to finish typewriters and other office machines.

The Jonrich rubber disk is normally supplied with nuts and washers for a ¼-in. shaft; so enlarge the holes in the disk and washers with a ⅜-in. drill and discard the nuts, replacing them with two thin ⅜-in. nuts. Run one nut onto the shaft just far enough to touch the thrust bearing. Add a washer, the backing disk, the rubber disk, the other washer, and the final nut, in that order. Hold the first nut with a wrench to keep it from turning and tighten the other one. After slipping the lamb's-wool bonnet over the rubber disk, pull up the drawstrings tightly and tie them with a bow knot. Tuck this knot well under the inside edge of the buff.

The inside of the gear housing must be packed with a good grade of heavy gear lubricant, a small dab of which is shown in one of the photographs. The Oilite bearing, of course, is self-lubricating and will also provide enough oil to satisfy the thirst of the thrust bearing. It will do no harm, however, to place an occasional drop or two of No. 30 crankcase oil at the thrust-bearing juncture to replenish the supply.

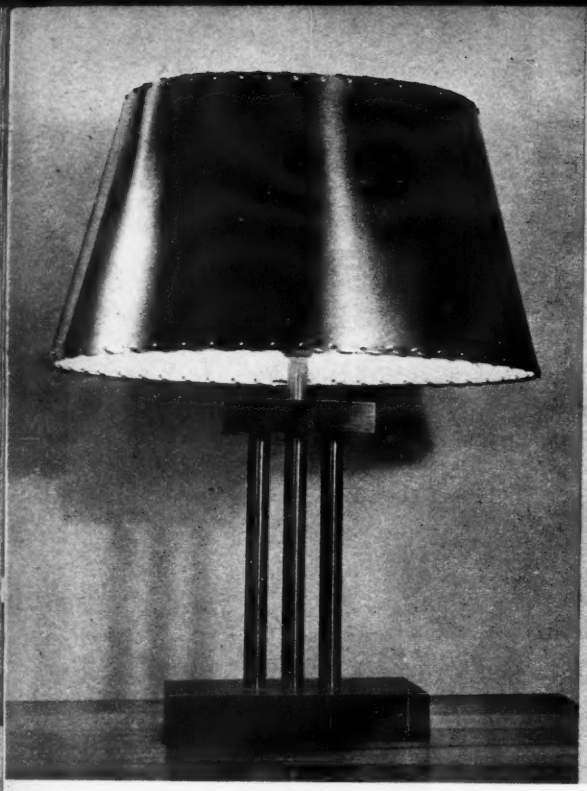
In normal use, our little power buffer handles very well with but the single rubber-covered grip, but a plastic knob, made from a car-shift handle of the ordinary type and bolted to the motor casing, affords two-handed operation when desired. A fitted wooden case should be made to such a size that it holds the tool securely and keeps it in good condition when the lid is closed. Finish the inside of the carrying case with several coats of aluminum paint. The outside will prove attractive if painted with the same wrinkle enamel, either red or black, that you used when finishing the gear housing.

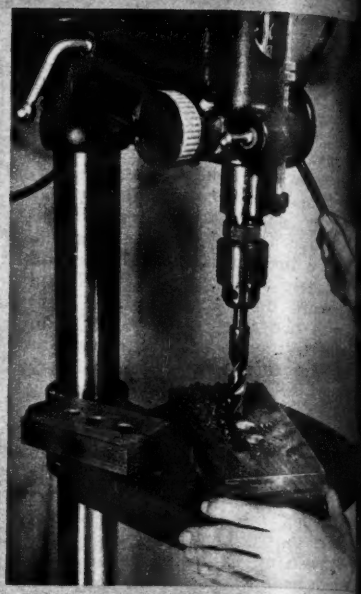
Be sure to secure a highgrade motor, preferably one of the repulsion-induction type—the best for starting under load. •

Mount the armature between centers on your lathe and turn the shafting down to fit the pinion gear.

Support the motor in one hand to take up shock and drive the pinion gear onto the shaft with a mallet.

Before attaching the gear housing, with the shaft and disk, to motor, daub on a blob of heavy grease.





Boring the holes in the base and the top. The two end holes in the top don't go all the way through, but all the other ones do.

Modern TABLE LAMP

Design as clean and sparkling as a new-fallen snow and construction of the utmost simplicity are featured here.

By Henry and Richard Hanscom

AN especially attractive table lamp of modern design, which will fit in with almost any room arrangement, is made by combining some simple woodworking with a few easily adapted pieces of stock metal tubing.

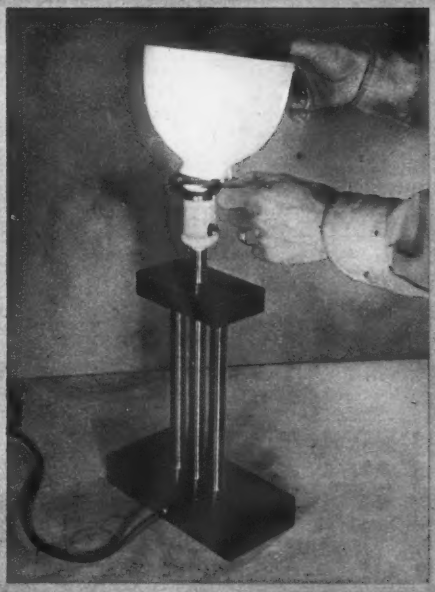
The base and top can be made of any cabinet wood, such as walnut, mahogany, or birch—walnut is unusually attractive when used with the polished-brass tubing. The holes in the base are bored completely through the block and are spaced 1¼ in. between centers. The holes in the top are spaced the same as in the base, but just the center one is bored all the way through, the outside ones being only ½ in. deep. All of these holes should provide snug fits for the tubing.

After the wood pieces are gotten out, they are given the usual finishing treatment before the lamp is assembled. Walnut, of course, should be filled before being varnished or lacquered.

The three pieces of ¾-in. (outside diameter) brass tubing are cut to the specified lengths. Next, they are polished with fine emery cloth, then given a final polishing with rouge. Finish each with a thin coat of diluted clear lacquer to prevent tarnishing.

Start assembling the parts by gently tapping or pressing the tubes into the blocks, being careful not to mar the finish. After the tubes are in place, use a metal drill to make the ⅜-in. hole in the side of the base. This hole runs all the way through into the center tube. Drive a stock brass wire bushing into the hole.

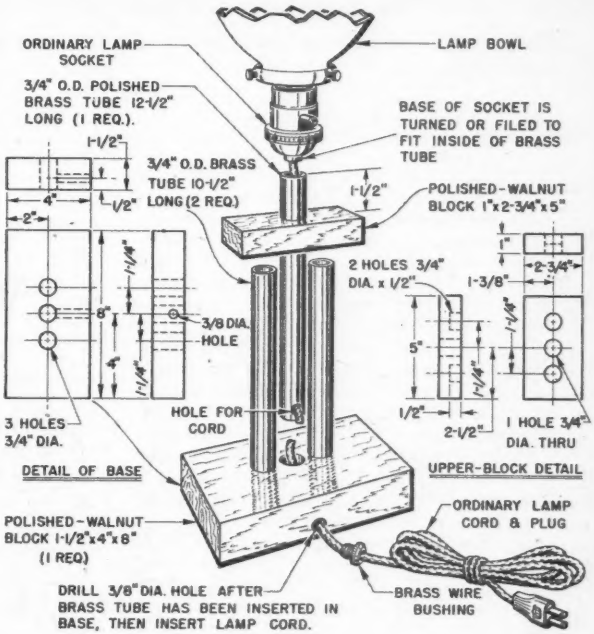
Wiring up the lamp is easy. All you need are a drop cord, a lamp socket, and a parallel-blade plug. All are stock items at hardware stores.

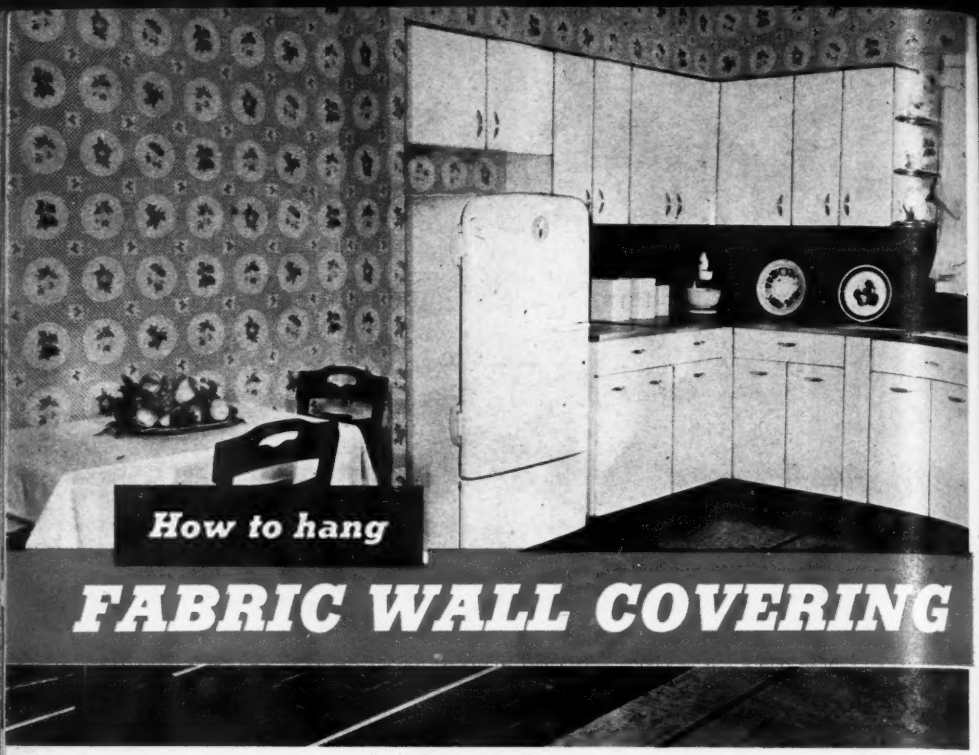


Attach a 6-in. glass reflector to the socket by means of a standard brass adapter. All you need now to complete the lamp is a ready-made shade.

The socket may be of brass or plastic. It should have a base of sufficiently large diameter to permit its being turned or filed down to make it a drive fit into the center tube. A 6-in. glass reflector is attached to the socket by means of a standard brass adapter. The oval shade in the photo was purchased ready made. It has a gold finish and measures 9½ in. deep by 12 in. wide by 16 in. long.

Flexible extension or drop cords of the type used here are prolific sources of short circuits; so when wiring up the lamp don't cut too much insulation off the ends of the wire. One end is secured to the previously mentioned ordinary lamp socket and the other end, after being led down through the center tube and out the hole in the base, is attached to a parallel-blade plug. Further to prevent short circuits, always replace badly twisted or worn cords with new ones. •





How to hang FABRIC WALL COVERING

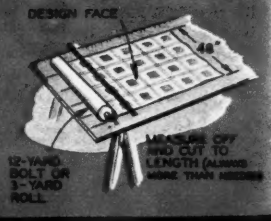
For resurfacing old walls quickly and economically, you cannot beat this beautiful, and durable material.

By Robert Scharff

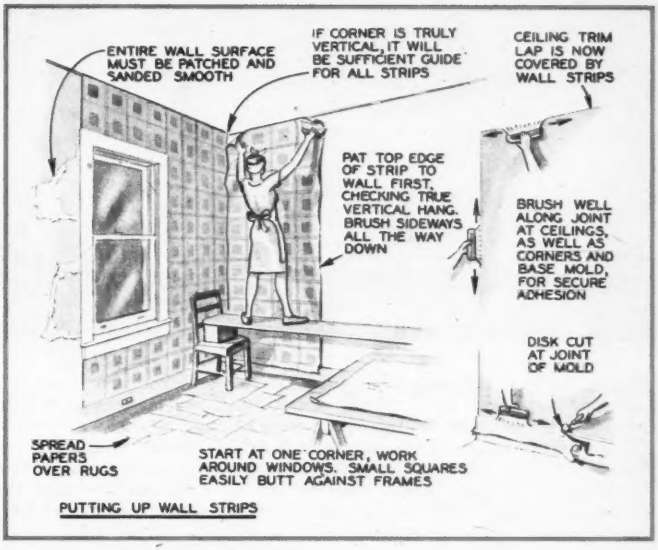
FABRIC wall coverings, such as *Sanitas*, have a definite place in the field of wall decoration as they provide a quick, economical, crackfree method for resurfacing old walls. Being made of coated cloth, not paper, they reinforce plaster walls, thereby preventing new cracks and hiding and strengthening old ones, and provide first-class decoration with either wallpaper-like pattern effects or paint-like solid-color treatments. Retailing for less than $3 a roll (36 square feet), the material makes a permanent, washable, and stainproof wall that will never require removal, for if any future redecoration is desired, either paint or wallpaper can be applied right over the fabric.

Despite these advantages, many a homeowner refuses to attempt hanging this wall covering simply because he thinks there is some difficult trick to it. Actually, if the proper procedure is followed, it is no harder to hang than ordinary wallpaper, and practically the same tools are used.

Before hanging the fabric, you must prepare the surface. Here all the cracks are being filled.



These include a large pair of shears, a paste brush, a smoothing brush, a seam roller, a 6-ft. straightedge, a paper knife or Ridgely trimmer, and a ruler of some type. In addition, a stepladder, a flat-top 8-ft. table, and plenty of old newspapers to cover the floor should be at hand. The table and many of the tools may be rented from your local paint or hardware dealer.



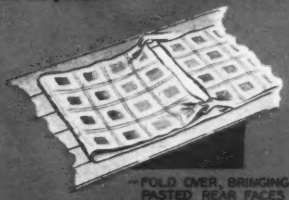
PUTTING UP WALL STRIPS

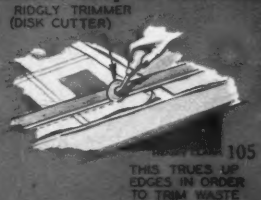
Before applying the fabric to old plaster surfaces, all wallpaper, paint, and calcimine should be removed. To take off old paper, wet it thoroughly with hot water applied with a wide brush, going over the entire room and working in vertical strips. When the paper begins to loosen, work it off from the top down, a strip at a time, using a scraper. Never try to dig with the scraper—you may damage the plaster. Wallpapers that are varnished or have a waterproof coating will require sanding with a rough paper before soaking so the water can get through. After the paper is removed, sponge the wall to remove any remaining bits of paper and old paste.

Painted or calcimine surfaces should be washed down with a strong soda solution

Brush on the wheat paste evenly to produce a well-distributed smooth coating without air pockets.

Using a paper knife or patented trimmer, neatly trim the excess material away on both sides.





Hang the strips perfectly plumb with the walls, matching all the patterns and butting the edges.

Smooth down with a stiff brush, working from side to side to prevent stretching the wet, sodden fabric.

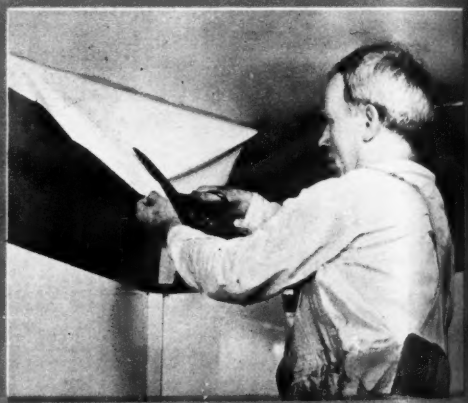
(three or four heaping tablespoonfuls of sal soda or borax to a gallon of water) followed by a warm-water vinegar rinse (two tablespoonfuls of vinegar to one gallon of water). Avoid getting the solution on woodwork since it will damage paint or other finishes. When the surface remains glossy after treatment, dull it by rubbing with steel wool or sandpaper. Next, fill all cracks with spackle or plaster of Paris, following manufacturer's directions. When dry, sand down all rough spots, patches, and edges; then apply a thin coat of glue sizing, using a wide brush. Glue sizing can be purchased from your local paint or hardware dealer and is prepared for use in accordance with the directions on the box.

If the wall has a stippled finish, sandpaper it and follow up with a thin-batter coating made from glue sizing and patching plaster. Allow this to dry thoroughly; then sandpaper smooth.

Over wall boards, apply spackle or Swedish putty to all joints and nail holes and, when dry, sand smooth; then brush on a sizing coat made from four parts varnish and one part turpentine.

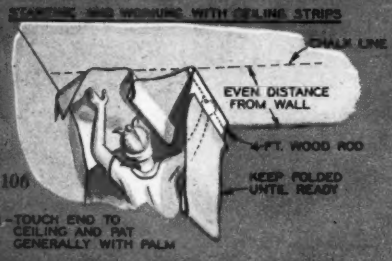
To figure how much wall fabric you need for a room, measure its size and then use the estimating chart given at the end of this article.

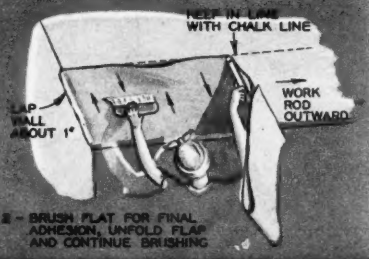
For easy handling when covering a ceiling, drape each strip over a wood or cardboard pole held in left hand.



To form joint between walls and ceiling, extend ceiling fabric down walls to make ¾-in. overlap all around.

STARTING AND WORKING WITH CEILING STRIPS



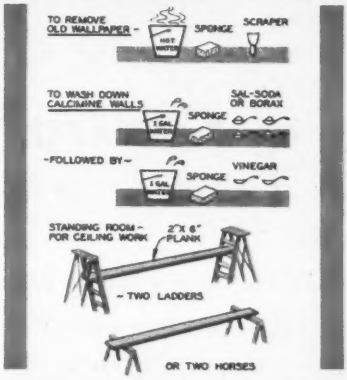


Check the vertical and horizontal alignment; then go over the seams with a seam roller.

Wipe the surface with a damp sponge to remove spots and excess paste; then trim top and bottom.

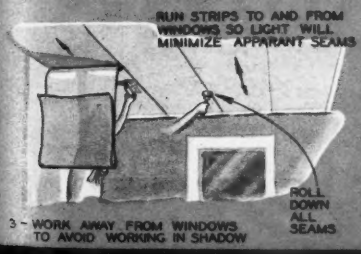
After buying the material, examine it before actually starting to work, checking the run numbers and matching up the rolls. Cut each roll into strips of the required length (slightly longer than the space they are required to fill), using a sharp knife and a straightedge. If you're using a plain color, reverse every other strip. Apply wheat paste (mixed as directed on the package) to the back of each strip, brushing thoroughly to form a smooth, evenly distributed coating. Never pile the paste on—this may cause air pockets to develop later under the fabric. Fold the pasted sides together, as shown, and neatly trim the waste away. Plain patterns need be trimmed but ½ in. on each side.

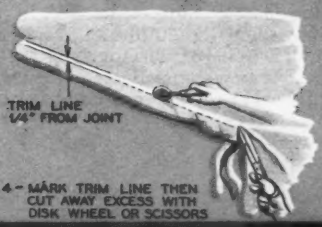
Hang the strips perfectly plumb with the walls, matching all patterns at [*Continued on page* 132]



Cover this overlap later with wall fabric. Here fabric is a finishing strip above a row of built-in cabinets.

In recesses, the material can be skidded into position or folded under and brushed into place, as shown here.





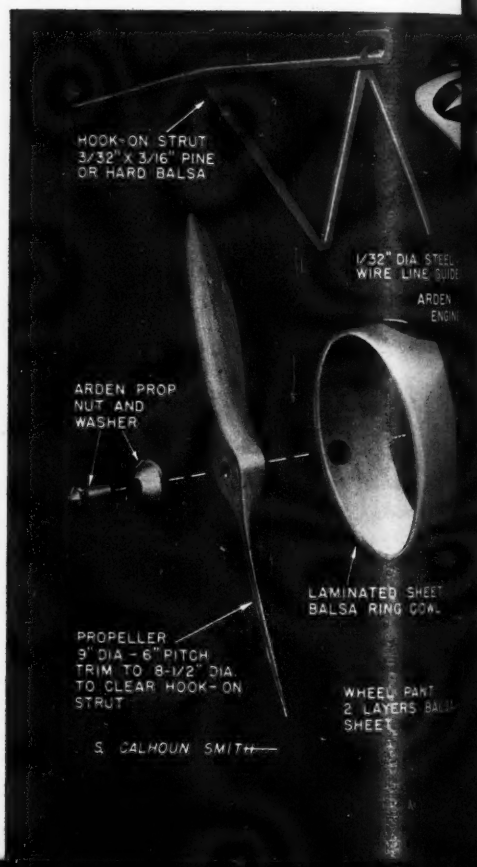
Control-Line Curtiss "SPARROWHAWK"

Build and fly this 30-inch exact scale Model of the famous Curtiss shipboard fighter. For .19 to .36 engines.

By Paul Plecan

IF you're looking for beauty and realistic performance in a control-line ship then look no further—this snappy version of the famous shipboard fighter the ill-fated dirigible the U.S.S. Macon carried will fill every desire. With its gray fuselage, silver and yellow wings, blue tail surfaces and fuselage band, your model will attract plenty of attention. Unusual in that the construction is of solid balsa with no built up surfaces, you not only can achieve a glass-like finish but repairs are easily made. And when it comes to flying, you'll find few scale biplanes can match the handling ease and realistic performance of this job.

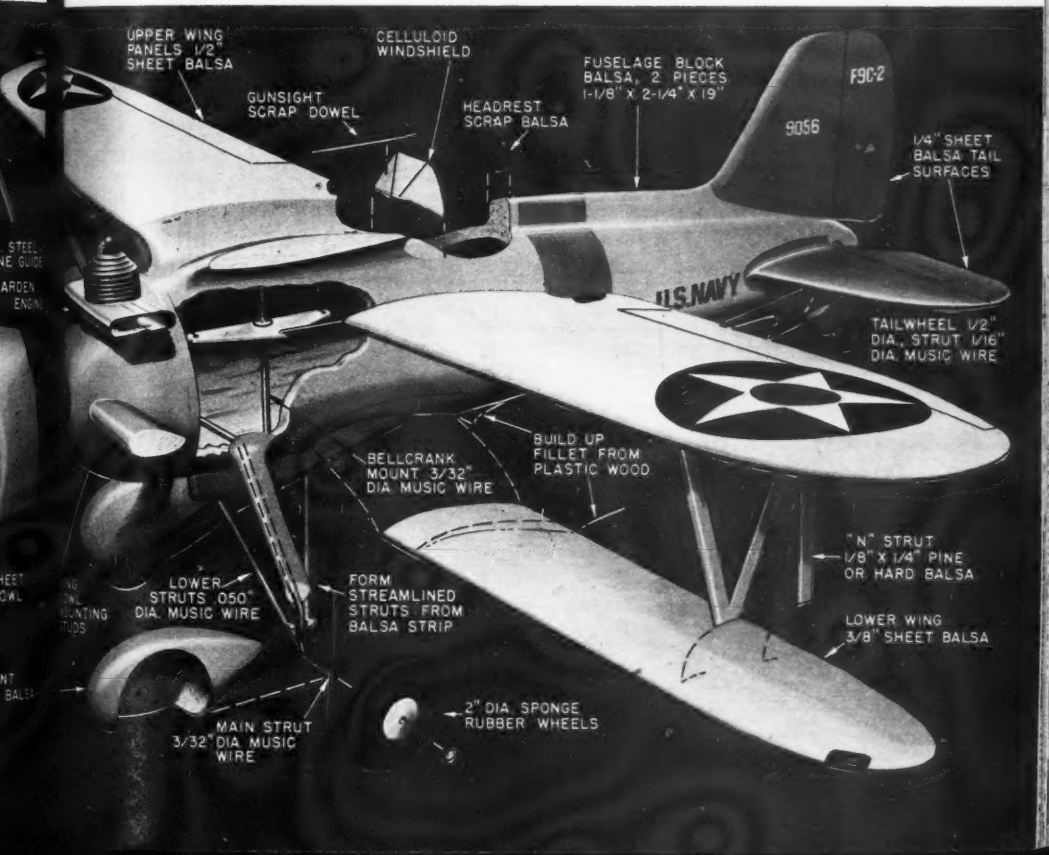
Start construction of the fuselage by obtaining two blocks of medium balsa measuring 1⅛x2¼x19 in. Spot cement both together and then proceed to trace the full size side view outline on the 2¼ in. wide side. Next, cut the outline to shape, using a hand or Syncro vibrator type jig saw. After the side view outline is cut to shape, carefully carve the exterior curves as illus-

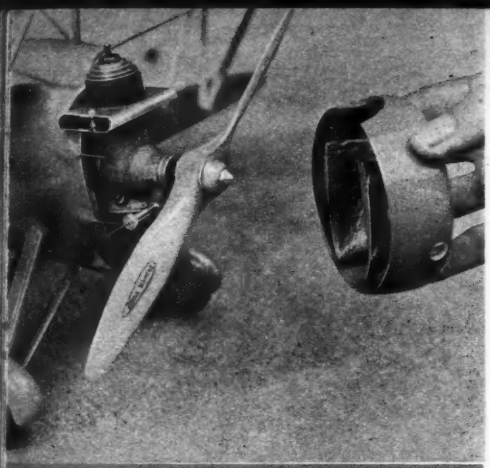


Author Paul "Pablo" Plecan and his Sparrowhawk. Original model was powered with an Arden .19 power plant.

trated in the perpective drawings. Shape the fuselage carefully, working down to the desired shape in easy stages with the aid of cardboard templates, which are made by tracing the fuselage cross sections onto stiff cardboard and cutting out. Although the headrest-turtleback can be carved separately, we recommend that it be carved integral, which will result in a better fillet and finish. The wing root fillets should present no unusual problem, other than wrapping sandpaper around a cone-shaped stick that will produce the desired contours. Take extreme care when tracing the airfoil section on to the gull wing roots, as the flying ability of your model will depend on both upper wing panels being mounted at the same angle of incidence. Progressively finer sandpapering finishes the fuselage externally. As a protective measure, paint the fuselages with wood-filler compound, followed with sanding and several coats of dope to lessen the chance of getting the balsa all nicked up in handling while the internal hollowing is taking place.

Now that the exterior is completely shaped, cut apart the fuselage blocks and proceed to hollow out the interior to the indicated wall thickness. A small gouge of the Exacto type will do the job well. Once the fuselage has been hollowed out, you

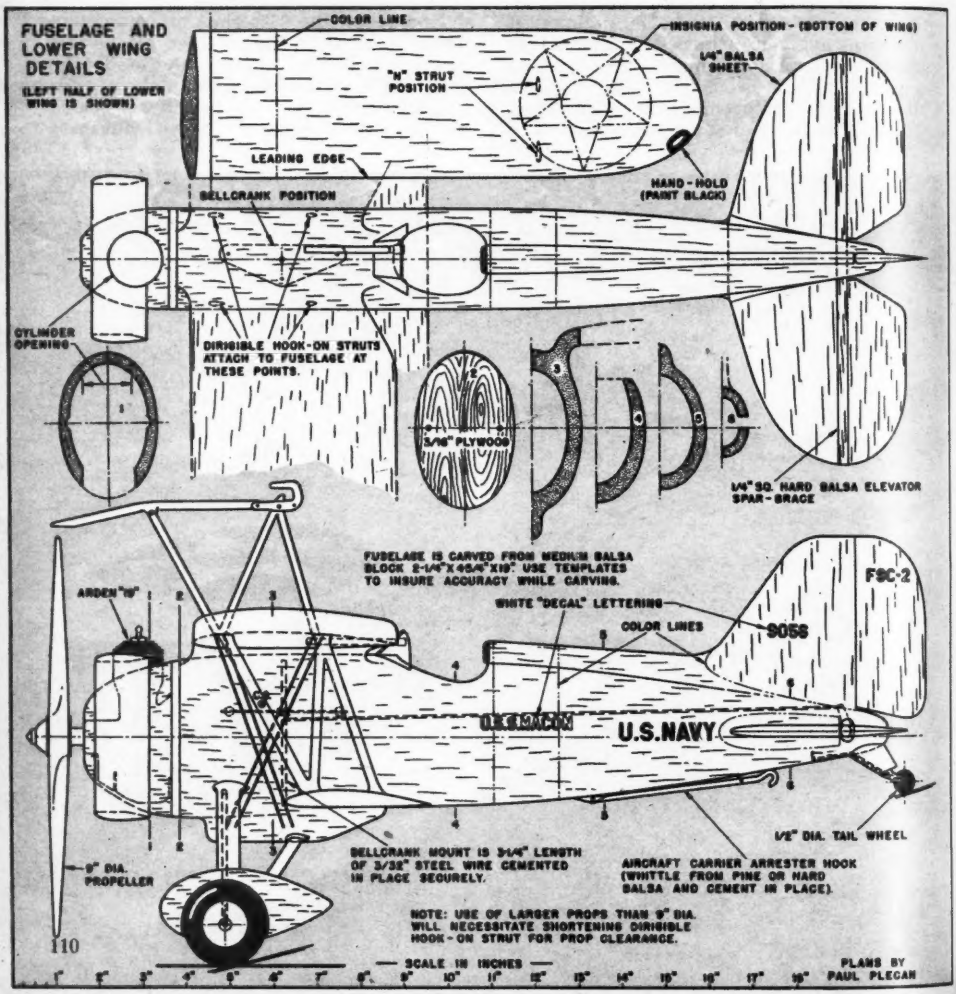


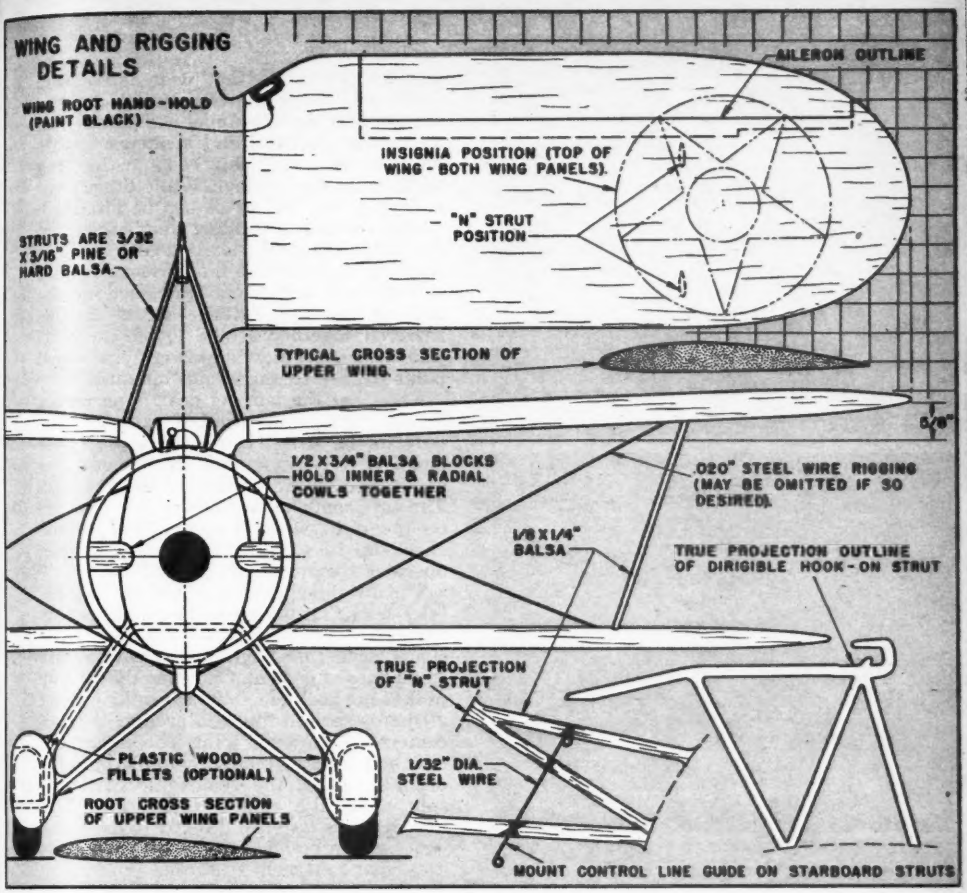


Removable cowl is built from pieces of 1/8 in. sheet. Hold in place as described in text.

can mount the bellcrank, which should pivot on a length of steel wire, with washers soldered to the wire just above and below the bellcrank to keep it in position. Now connect the lead-out wires and elevator push rod. The push rod should be left a little on the long side, so it can be trimmed to fit when the elevators are in place. After the bellcrank mounting has been strengthened with Plastic Wood fillets, the two halves of the fuselage can be permanently cemented together. If a prominent seam is noticeable, fill it in with wood filler and sand flush.

The nose can now be trimmed, if your engine is of the radial type mounting, and the front bulkhead securely anchored in place. Should your engine have beam-type mounts then vary the position of the front bulkhead and the method of construction





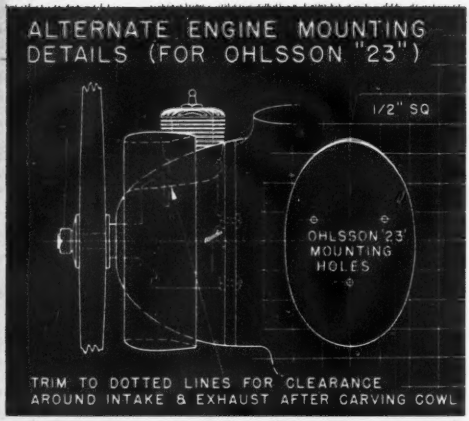
to fit your particular mounting lugs.

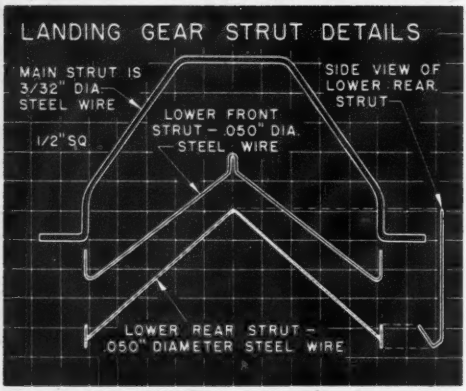
Cut the stabilizer from ¼-in. sheet soft balsa, carve and sand it to shape and then slip it in place in the rear fuselage slot. Fashion small fillets around the stabilizer root where it joins the fuselage and then cut and sand the elevators to shape.

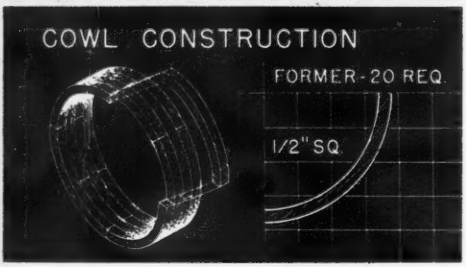
The elevators are attached to the stabilizer with regular cloth hinges, or you may use control-line hinges recommended by your local hobby dealer. After the stabilizer and elevator are hinged, hold the bellcrank in the neutral position and mark the push rod so it can engage the control horn when the elevators are also neutral. This will insure equal up and down control surface movement.

The main landing gear strut can now be slipped into place and anchored securely internally with Plastic Wood fillets. Seal the slot in the fuselage with a sheet of balsa, as shown, and give the landing-gear-to-fuselage joint a few coats of cement before mounting the firewall in place. The lower wing can now be sawed to shape, carved and sanded to the correct airfoil shape, and finally cemented to the bottom of the fuselage. Watch the line-up at this point to make certain the wing is square with the fuselage when viewed from above and from the front. Also make certain that the incidence is the same as shown in the plans. The lower wing root fillets are formed of Plastic Wood which is allowed to dry thoroughly once it is moulded to shape. Final sanding will be tedious, as this compound dries to a hard texture.

The upper wing panels are cut from the prescribed stock, carved and then sanded to shape. The chore is conventional in every respect, except for the tiny "hand-holds" which are cut into the trailing edge near the wing roots. When you are ready to mount the upper wing panels, place the assembled lower wing and fuselage in a level position on the bench, propped up at







Cockpit detail. Windshield is cemented in place after fuselage is painted. Gun sight is ⅛ in. dowel.

various points, so that it is fairly well anchored. Using more balsa blocks and scraps, prop up the upper wing panels at the proper dihedral and incidence angles. Then cement the wing roots to the gull sections on the fuselage. While the cement is drying, the "N" struts can be fitted.

The secondary landing gear struts are now added. Once the landing gear has been checked (so that the model leans neither to right nor left when supported by the landing gear) the three struts can be soldered together at the lower juncture. The wheels are now added and the wheel pants carved to shape and mounted.

Note that the landing gear is purposely flexible. The lower front strut is fastened only to the wheel pants while the upper end is left free to move in and out of a small hole in the bottom of the fuselage. The wire control line guide is now installed on the right wing N strut. After a final check-up to see that the control system operates smoothly, add the tail cone.

The dirigible hook-on strut assembly (or "sky-hook," as we prefer to call it) should present no problem. After making two N struts, tack them lightly in position with small dabs of cement. Checking the line-up of the long hook piece and carefully cement all joints several times to produce a small cement fillet at each joint. The engine can now be bolted permanently in place. In the original model, the removable cowl was split along the cylinder centerline. This inner cowl is fastened directly to the radial cowl, so that both remove at the same time. The cowl can be held in place with dress snaps or by the tube and wire method. The latter consists of four short wires cemented to the fuselage nose which slip into four short lengths of tubing that are cemented to the cowl. By using tubing that fits snugly around the wires, a firm mounting can be achieved.

Your model should now be ready for coloring. Brush or spray the fuselage with gray dope. The cowling, wheel pants and "sky-hook" also get the same treatment. The lower wing is silver. The upper wing panels are silver on bottom and yellow on top. The tail surfaces and the band around the fuselage are blue. Lettering is of the decal variety, soaked and slipped into place. The squadron insignia just under

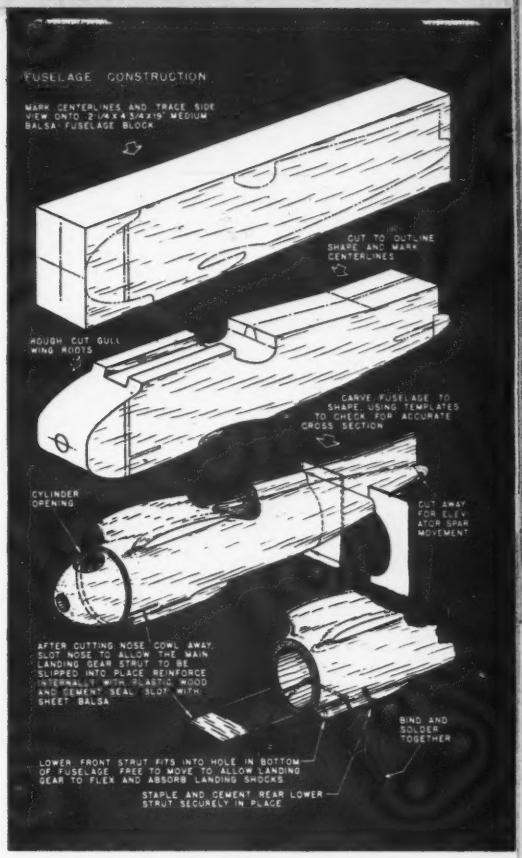
FULL SIZE PLANS

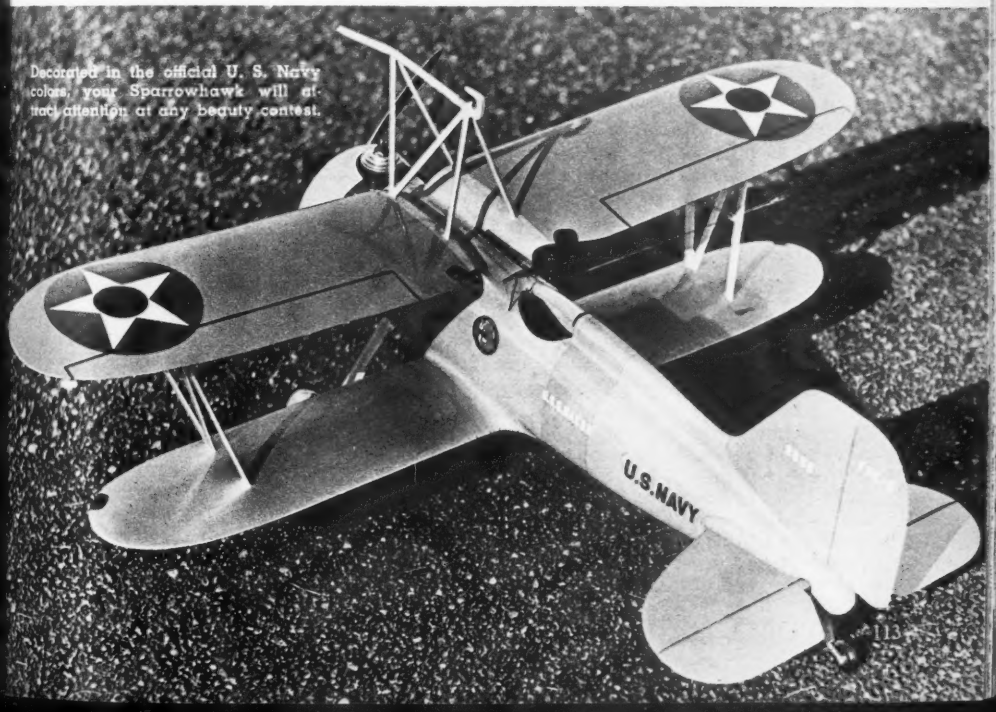
will make building easier. Send 50 cents for your set to: MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Connecticut. Please specify Plan No. 398.

the windshield is available at any hobby shop. The star-in-circle wing insignia will be hard to get, but new-type insignia can be cut down and a red inner circle added to resemble the pre-war style. Remember to paint the area around the hand-holds black and to outline the aileron with strips of black tissue. The engine should be carefully covered with cloth and masking tape and the windshield masked off, so that the entire model may be sprayed with hot fuel protector. Be sure to follow the instructions of the particular brand you use. This is a good idea even if regular gas is used for fuel, as the model is easy to wipe off neatly.

The model should balance 1½ in. behind the leading edge of the upper wing. We found that a 9 in. Power Prop of 6 in. pitch was ideal for the Arden .19 Engine when cut down to 8½ in. dia. to clear the "sky-hook." The prop should be painted silver with the back of the blades black.

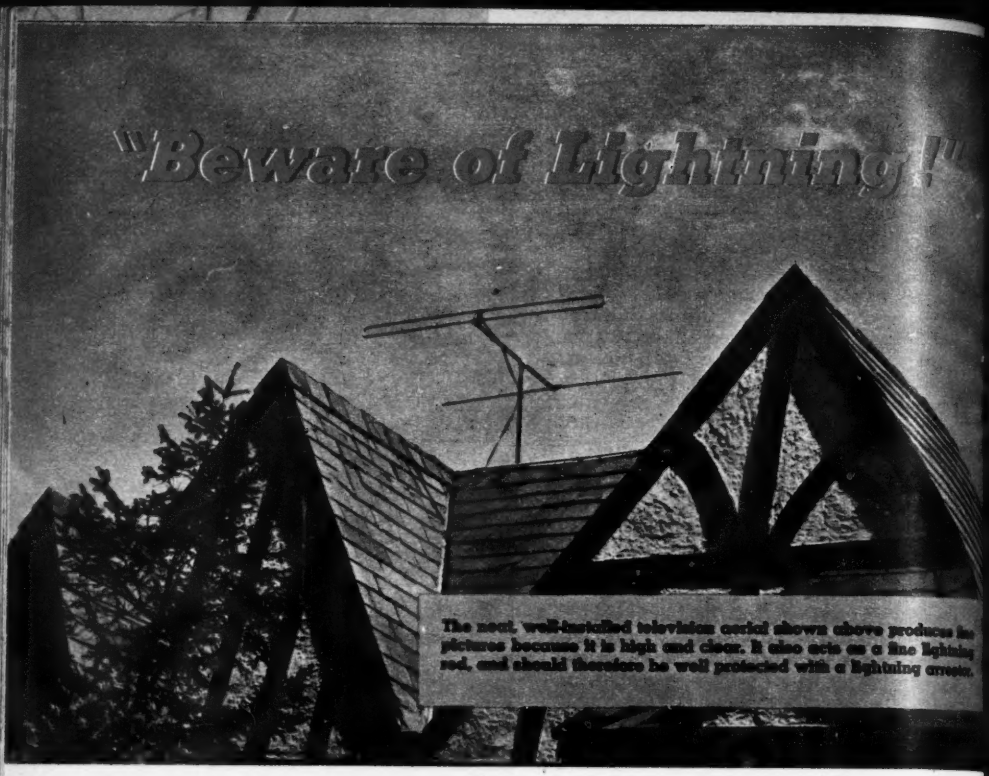
In flight testing the model, allow the engine to rev up quite a bit, as the model will be under better control when flying faster. To keep the model from flying towards the center of the circle, fasten a small flat plate to the outboard "N" strut. This will create a yawing effect towards the outside of the circle, keeping the lines tight. Once you have acquired confidence in the flying ability of the model, you can cut down or remove the flat plate. •





Decorated in the official U. S. Navy colors, your Sparrowhawk will attract attention at any beauty contest.

"Beware of Lightning!"



The neat, well-installed television aerial shown above produces fine pictures because it is high and clear. It also acts as a fine lightning rod, and should therefore be well protected with a lightning arrestor.

By Robert Hertzberg

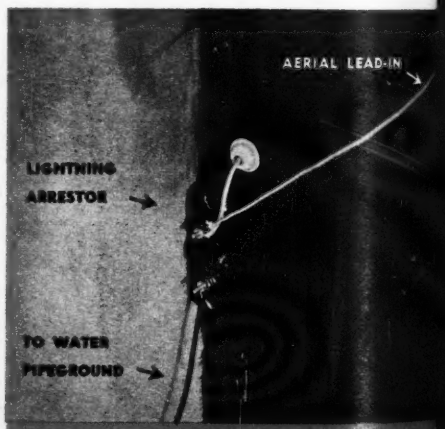
"AN antenna for television or FM reception should be as high and as clear as possible. On most homes the chimney is the logical spot because it protrudes above the rest of the house." From an instruction manual for television receivers.

"A lightning rod, to serve its purpose, should be as high as possible. On most homes the chimney is the logical place for it." From a pamphlet dealing with lightning protection.

A television antenna is made of one or more metal rods fastened to the chimney. A lightning rod is a metal rod fastened to the chimney. You are therefore quite justified in jumping to the immediate and somewhat startling conclusion that a television or FM aerial *also* acts as a very good lightning rod. As a matter of sober fact, *any* outside radio aerial does.

The need for radio aerial protective devices, known as lightning arrestors, was well recognized during the early days of broadcasting, when practically all radio receivers required long outside aerials to produce any results at all. However, even the smallest and cheapest sets of the last ten years or so work quite satisfactorily with built-in aerials, which consist usually of a flat pancake or wire tucked into the back of the cabinet. Radio designers had more or less forgotten about the aerial as a mechanical structure until the FM and television boom suddenly made them realize that lightning is still with us.

I'm not inferring that your house is likely to go up in smoke some stormy afternoon just because the roof is decorated with a tricky antenna that looks like a cross be-

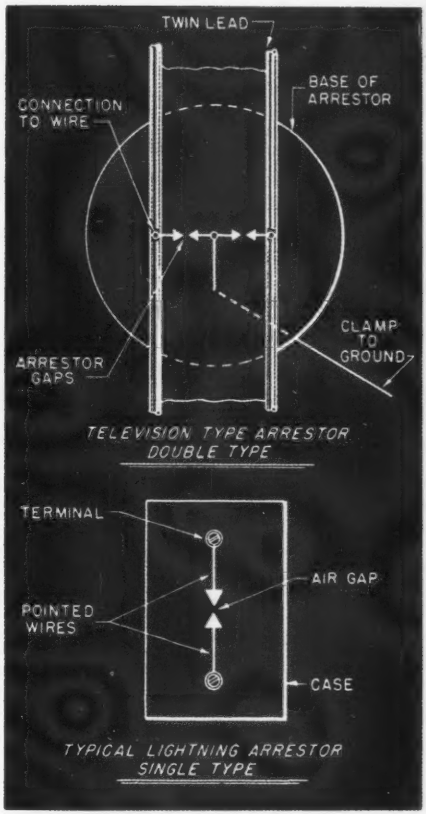


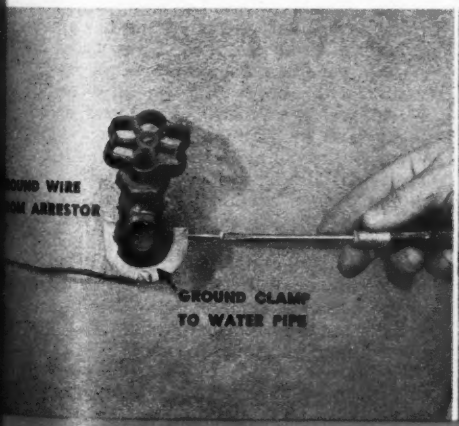
A lightning arrestor for an ordinary aerial costs less than half a dollar and is installed in less than half an hour. Here is a typical setup.

tween a clothes drier and a pigeon roost. Very few aerials are ever struck directly by lightning, for the simple reason that they tend to drain off electrical charges in the atmosphere *before* they have a chance to build up to Jovian dimensions. Any exposed metallic body that makes contact or connection with the ground acts the same way. Power and telephone wires on poles are particularly susceptible, and for this reason are fitted with elaborate protective devices.

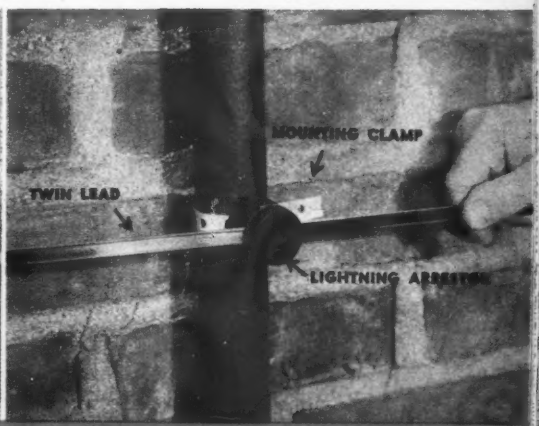
Long before a storm breaks, the air is highly charged with vast quantities of static electricity, supposedly generated by the friction of clouds against the upper atmosphere. Since clouds are usually closer to each other than to the ground, they discharge their accumulations across the sky more often than vertically to the earth. Sky lightning is terrifying but quite harmless. The slow charges of electricity that literally drip down through exposed radio aerials are much more insidious because they are steady and silent. One day your set just stops working, although all the tubes light and it sounds "live." A service call reveals that the little coil of wire connected to the aerial circuit has burned out, and you say, "Now how could that have happened?" Because it does happen regularly, replacement antenna coils are regular stock items in radio repair shops.

A conventional random length aerial used for ordinary sound reception is easily and cheaply protected. "Lightning arrestor" sounds imposing, but actually the device is a very simple thing consisting of two thin wires or rods, with pointed ends separated a couple of thousandths of an inch. One [*Continued on page* 134]





The garden hose faucet is an ideal "ground" for the lightning arrestor. A special C shaped connector clamp, costing 15 cents, makes the job easy.



For FM and television aerial lead-ins, using double wire, use a clamping type lightning arrestor which fits around any convenient pipe. Cost: 1 dollar.

How To Build SNIPE

PART I

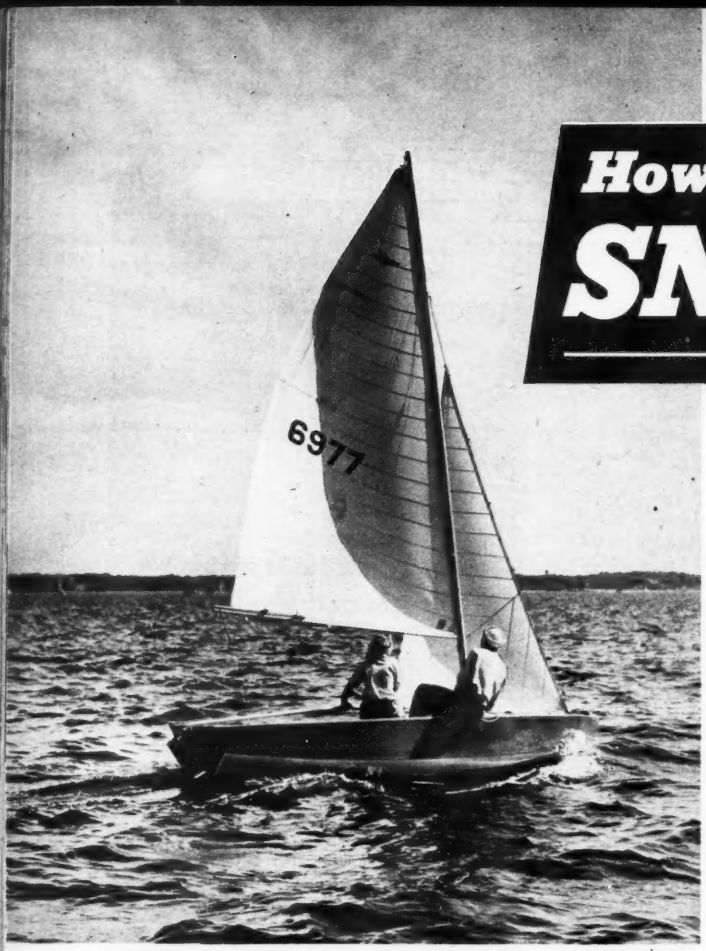


Photo by Rosenfeld

The world's largest class of one-design sailboats — more than 7,200 boats have been built from this plan.

By William F. Crosby

SNIPE is one of the fastest of the smaller racing sailboats and has repeatedly beaten larger boats with considerably more sail area. She will ghost right along with virtually no perceptible breeze, and in strong winds—when many other craft, regardless of size, are forced to run for cover—she will stand up and take it like a Trojan. Thus the rig is a happy medium. It is a jib-headed knockabout having a 67-sq.-ft. mainsail and a 36-sq.-ft. overlapping jib, making a total of 103 sq. ft.

The hull is of the conventional V-bottom type and measures 15½ ft. in length over all by 5 ft. beam. It is planked with ¾-in. conventional stock. Plywood may not be used for planking, but may be used for the decking, transom, frames, and rudder. The rules require that the completed boat, without skipper or crew, must weigh at least 450 lbs. Ballast may not be carried to make up any deficit in this weight.

Knockdown parts for the boat, which are available from several sources such as the Varalyay Boat Works, 1710 W. 166th St., Gardena, Calif., and H. F. Guenin and Assoc., Noroton Heights, Conn., will prove to be a big help when building her. She is subject to the rules of the Snipe Class International Racing Association, an organization with representatives all over the world and with nearly 300 active racing fleets. The restrictions set up by the Association are so effective that *Snipe No. 1*, built in 1931, is still actively racing and giving a good account of herself; so you need have no fear that your boat will become obsolete or that you will have to spend money to keep her up to date. This is one of the chief reasons for the popularity of the class.

Each boat, before being eligible to race, must have a measurement certificate. Measurement is done by fleet measurers or measurement committees and the results are entered on a comprehensive measure-

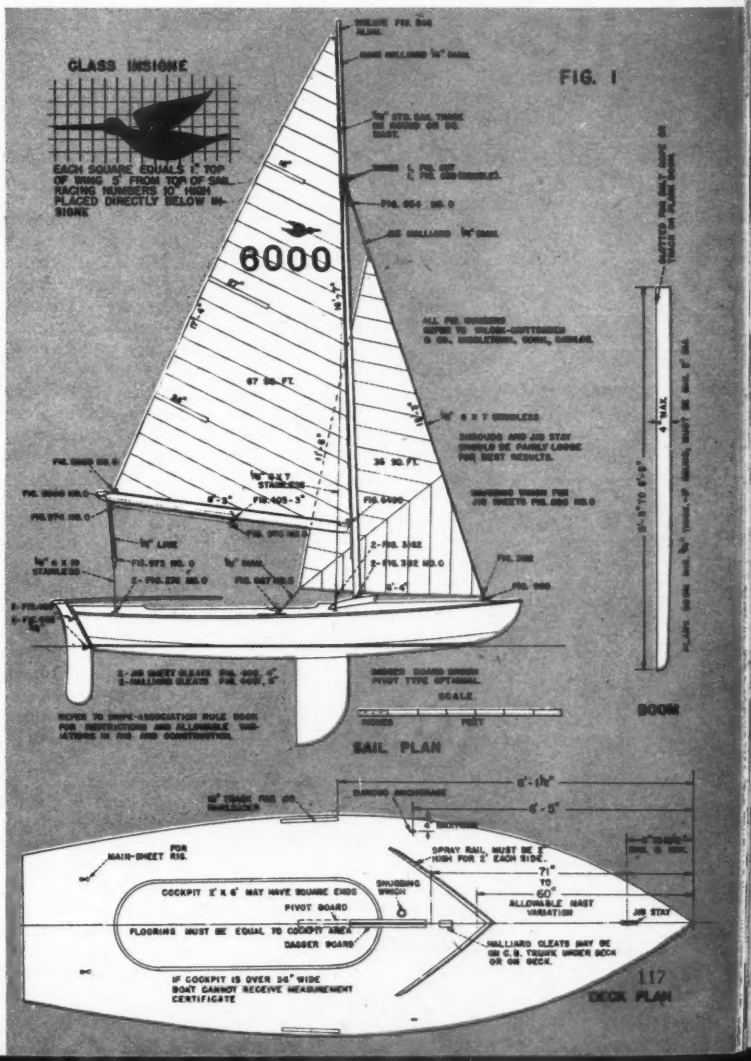
ment sheet, which is filed with the class secretary. The assignment of a racing number costs $1 and dues in the Association come to $2 a year. Each Association Member receives a membership card and a copy of the current rules-and-record book. If a numbered boat changes hands, the new owner pays $1 to have the official records changed so the boat is listed in his name. A fleet is chartered by the Association when it has five or more *Snipes* and each fleet chips in with $5 a year to the Association. Large-scale plans of the boat are available from the MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Conn., at a cost of $5 per set. Please specify Plan No. B-160. There are no other charges or royalties to be paid. The address of the Executive Secretary of the Association is 522 Stellar Ave., Pelham 65, N.Y.

In the United States, divisional-championship trophies are raced for each year; then the most important U. S. regatta—for the National Championship—is run off and the winner is sent to the World's Championship Regatta, which is held in various countries. In 1949, this regatta will probably take place in the United States.

The plans for *Snipe* should be followed as closely as possible, for even though you, personally, may not be interested in racing, the day may arrive when you will want to sell your boat. If it is not eligible to race, its value will be very low.

There are certain options in the plans—it would be wise to make up your mind right at the start about these. Based on generally accepted theories, a *Snipe* should be built as lightly as possible and still come over the 450-lb. limit. Extra braces, intermediate frames, and so on should not be used. You have a choice of two types of centerboards, neither of which can weigh more than 80 lbs. The closer you keep to this weight, the better your boat will perform. One board is the conventional pivot type, which is ideal for locations where the water is shallow. The other is a daggerboard. This type is harder to handle, but it puts the weight down low where it will do the most good and takes up less room in the cockpit.

Some latitude is allowable in locating the board and the mast—the best balance is generally achieved when the mast is placed at the forward end of the allowable limits and the centerboard trunk as far aft as allowable. The location of the lower end of



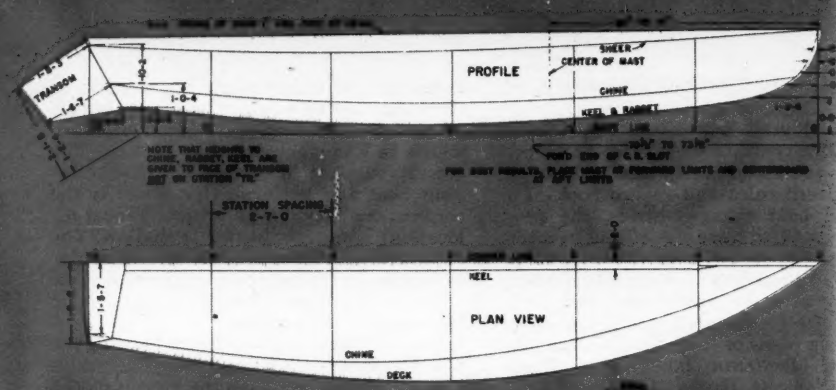


TABLE OF OFFSETS

HEIGHTS ABOVE BASE LINE

STATION	0	1	2	3	4	5	TRANS.
KEEL	—	0-6-3	0-3-6	0-2-2	0-2-4	0-4-4	0-6-6
RABBET	—	0-6-3	0-3-6	0-2-2	0-2-4	0-4-4	0-6-6
CHINE	—	0-11-1	0-9-0	0-8-0	0-8-1	0-9-6	1-0-4
SHEER	2-1-7	1-11-4	1-9-7	1-8-6	1-8-1	1-8-4	1-10-2

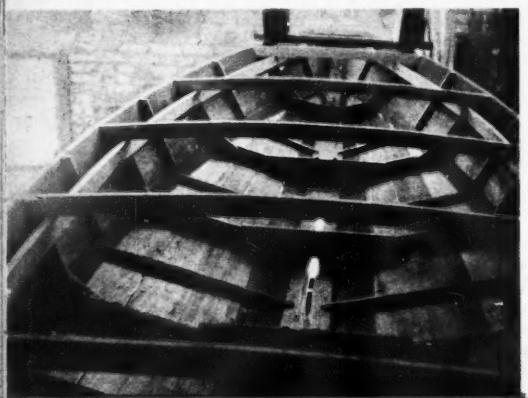
DISTANCES OUT FROM CENTER LINE

CHINE	—	0-10-4	1-7-5	2-0-3	2-1-1	1-10-4	—
DECK	—	1-9-7	2-2-6	2-6-0	2-5-2	2-1-2	—

FIG. 2- LINES & OFFSETS

NOTES

1. DO NOT SCALE-USE DIMENSIONS ONLY.
2. DIMENSIONS ARE GIVEN IN FEET, INCHES, AND EIGHTHS OF INCHES TO OUTSIDE OF PLANKING.
3. FRAMES NO. 1, 2, AND 3 ARE PLACED ON FOR'D SIDES OF STATIONS; 4 AND 5, AFT.



Because it is a small, light boat, "Snipe" is reasonable in cost—amateurs have constructed her recently, complete with the sails and all the necessary fittings, for less than $300.

the jibstay is also variable. Most boats carry this about 12 to 13 in. aft of the stem.

Planking is usually Port Orford cedar. Philippine mahogany is too heavy here, but is entirely satisfactory for the keel, keel batten, and stem. Some builders use Sitka spruce for nearly everything, but this wood does not stand up as well in water as other species. The deck beams can be of Sitka spruce and the decking of ¼-in. plywood. The mast must be as light as possible, of Sitka spruce, hollow, pear-shaped, with a slot for the mainsail bolt rope. Rigging should be kept down to the minimum, preferably of ⅛ or $\frac{3}{16}$-in. stainless steel. There are no backstays, jumper stays, or spreaders. The mast should not be held rigidly in place with tightly set-up shrouds. Leave these quite slack and don't put mast wedges in the hole in the deck. Your *Snipe* will perform much better with this rig rather than one that holds the mast tightly in an upright position.

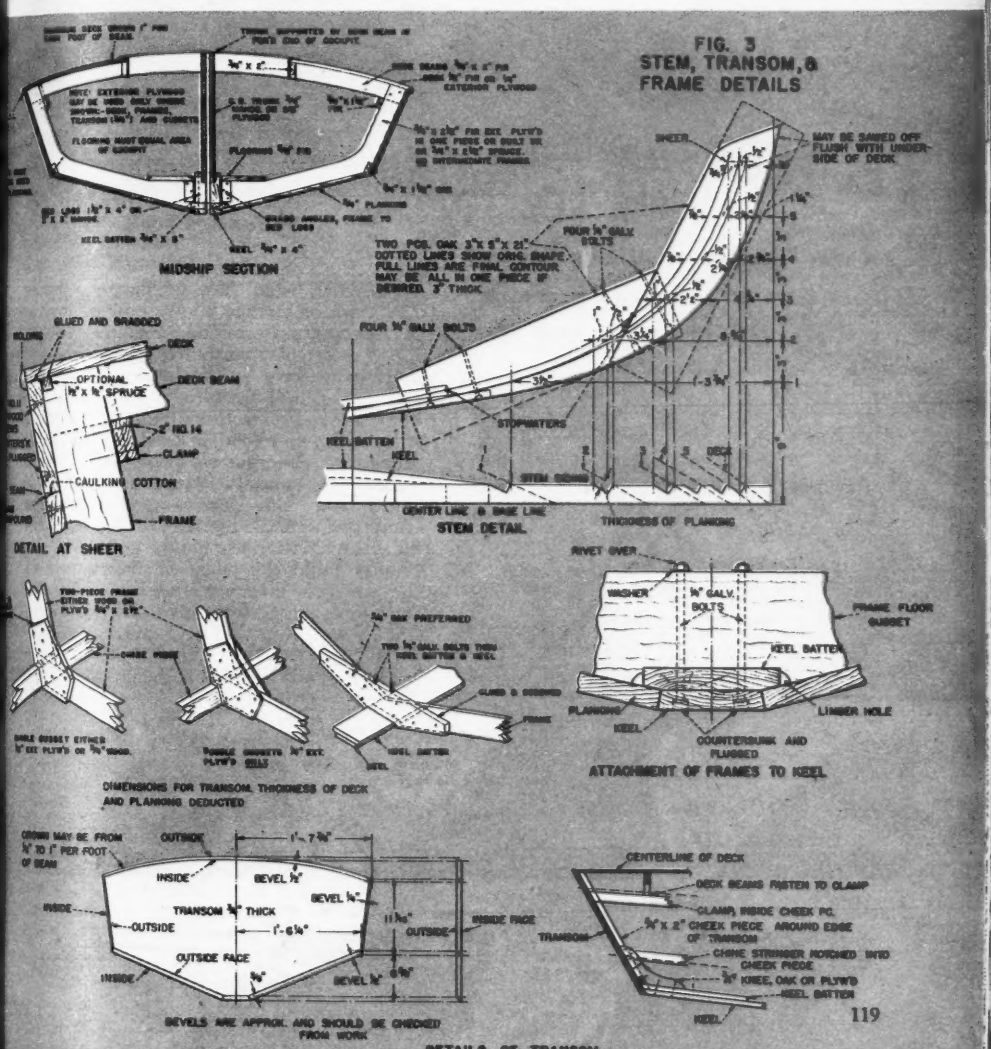
Before beginning construction, draw the lines (Fig. 2) full size on a smooth floor, on plywood, or on building paper. This drawing is made to be sure of getting everything right and to help in laying out the work. The table of offsets gives you the necessary dimensions in feet, inches, and eighths of inches—thus 1-11-4, translated, reads 1 ft. and 11 4/8 in., or 23½ in. The center line for the plan view and the base line for the profile must be perfectly straight and

parallel. The station lines must be exactly perpendicular to the base and center lines.

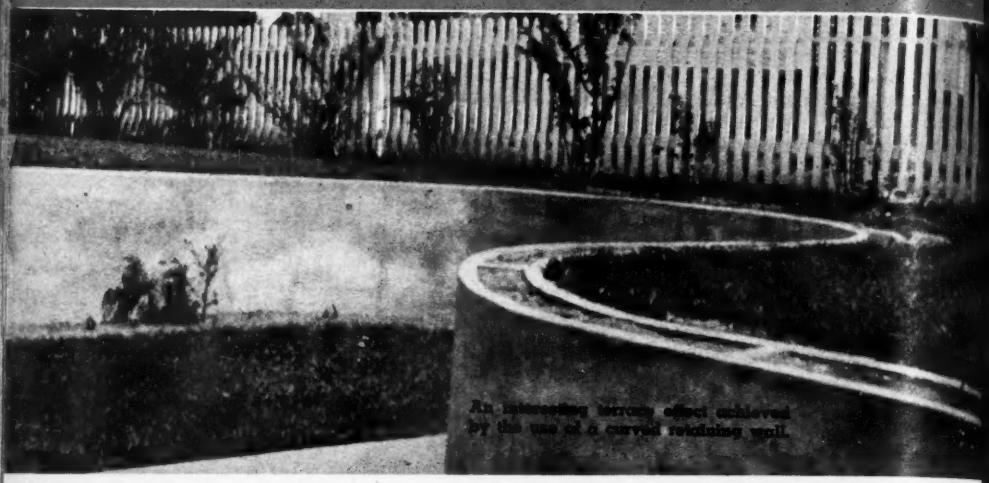
Note that the dimensions are given to the outside of the planking. This means that after completing the body plan you must take a pair of pencil dividers set at exactly ¾ in. and mark off the thickness of the planking inside each station to determine the exact shapes of the frames. When you are through, you'll have two parallel lines all the way around each section, one line representing the outside and the other the inside of the planking.

Next, on the body plan, draw the keel and keel batten on each frame, referring to the drawing labeled Midship Section (Fig. 3) for the exact dimensions. It is apparent also that the sheer line in the offsets is to the top of the decking at side; so you must deduct the thickness of the decking in order to get the exact top of the frame. You now have the shape of every frame. Transfer these shapes to your frame material, saw to size, and assemble as required. If you make the frames of plywood, you will find that by proper layout you can cut all of them and the transom from a single 4 by 8-ft. sheet of plywood. It takes some juggling to do it, but it can be done—and you may even be able to get the rudder out of the same sheet!

Our story will be continued in the March issue of MECHANIX ILLUSTRATED. •



POUR YOUR OWN CONCRETE RETAINING WALLS



An interesting terracing effect achieved by the use of a curved retaining wall.

By Thomas Trail

A heavy downpour will not wash away your lawn if you grade and install the proper kind of retaining wall.

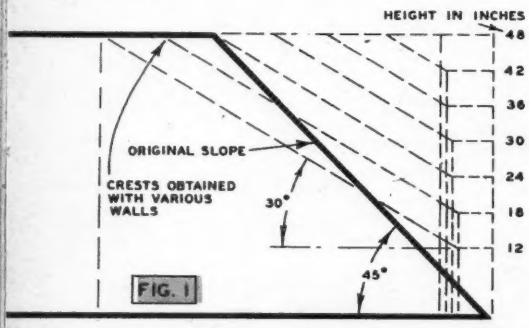


FIG. 1

ANYONE who has a sharply sloping lawn or terrace knows how difficult it is to keep grass growing on such a surface. Rains frequently wash away grass and soil and leave only an unsightly clay bank. Numerous methods have been tried in an effort to overcome this difficulty, but none has proven as effective, practical and permanent as concrete retaining walls.

Concrete retaining walls are simple to build, and their cost is moderate when compared with the benefits which they provide. Anyone who is handy with tools can readily build the wood forms into which the concrete is poured, and by following the simple suggestions given here can produce a wall that will be a credit to his efforts.

First of all, decide on the height of the

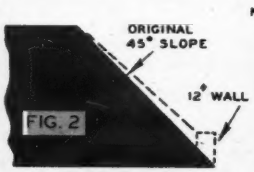


FIG. 2

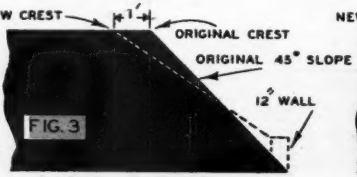


FIG. 3

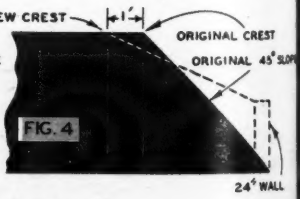


FIG. 4

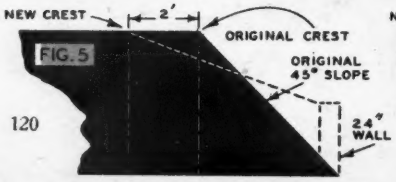


FIG. 5

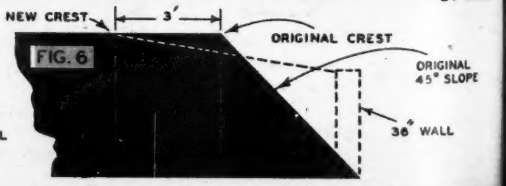


FIG. 6

wall. In order to be stable, the angle of a sloping lawn should never be steeper than 45°, and the gentler the slope the better. Therefore, we must figure how high to build the wall in order to provide the desired slope. Fig. 1 shows the positions of the lawn crest resulting from various wall heights. It will be noted that the higher the wall the farther forward will be the lawn crest and the greater will be the area of flat lawn obtained. Figs. 2 to 6 show various results obtained by using different wall heights and lawn crest positions.

Fig. 7 gives the recommended cross-section of a retaining wall and the dimensions of the various parts. This design does not require the use of steel reinforcement. The width of the base and the weight are such as to prevent the wall from leaning or turning over as a result of earth pressure on one side.

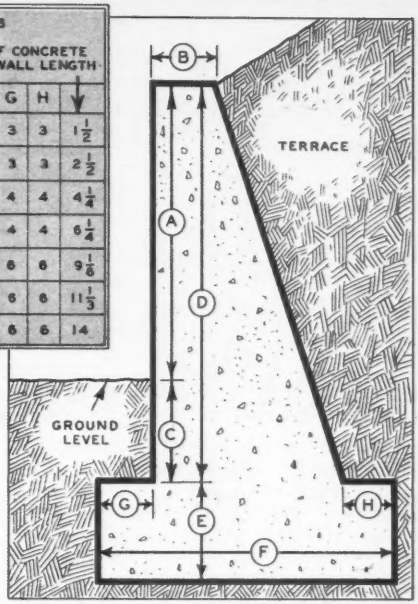
After the wall height and lawn slope have been decided, the next step is to excavate the ground to provide space for building and bracing the concrete forms.

Fig. 8 gives details of the forms. In order to produce a straight wall without bulges the forms must be rigid and well braced. The boards should be smooth on at least one side, and have tongue-and-grooved edges. Double-headed nails or screws should be used in fastening the forms so that they can readily be taken

WALL HEIGHT IN INCHES								CUBIC FEET OF CONCRETE PER FOOT OF WALL LENGTH
A	B	C	D	E	F	G	H	
12	6	4	16	14	6	3	3	$1\frac{1}{2}$
18	6	6	24	18	6	3	3	$2\frac{1}{2}$
24	7	8	32	24	8	4	4	$4\frac{1}{4}$
30	7	10	40	28	10	4	4	$6\frac{1}{4}$
36	8	12	48	36	12	6	6	$9\frac{1}{6}$
42	8	14	56	40	12	6	6	$11\frac{1}{3}$
48	9	16	64	44	12	6	6	14

FIG. 7

DIMENSIONS FOR VARIOUS WALL HEIGHTS



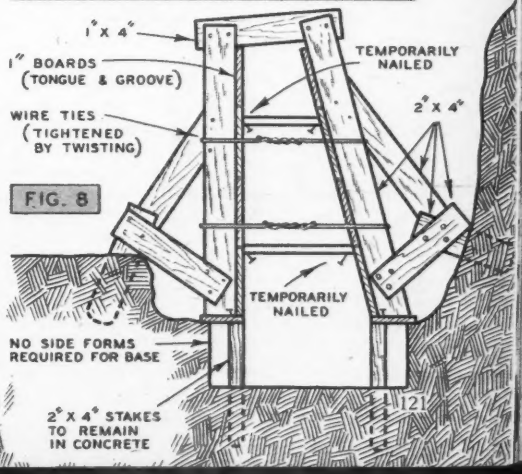
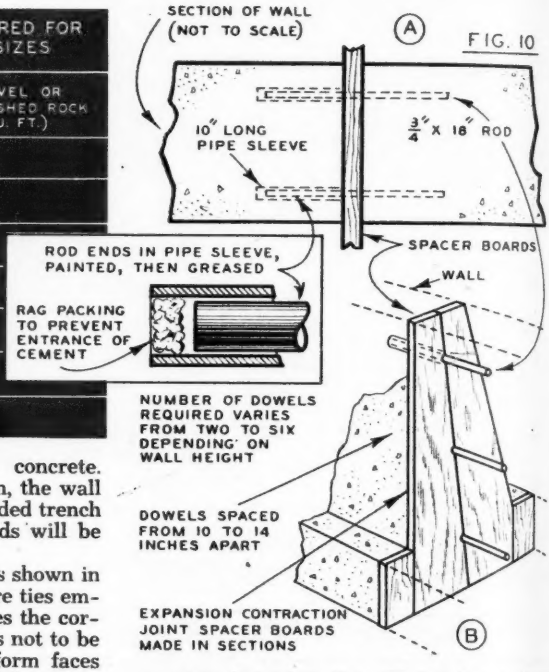


FIG. 8

The erosion of this beautiful lawn was effectively stopped by the construction of a concrete retaining wall. Leave the wall face straight if it borders the sidewalk.

FIG. 9 MATERIALS REQUIRED FOR VARIOUS WALL SIZES

WALL HEIGHT (INCHES)	CEMENT (SACKS)	SAND (CU. FT.)	GRAVEL OR CRUSHED ROCK (CU. FT.)
12	$\frac{5}{18}$	$\frac{7}{9}$	$1\frac{1}{9}$
18	$\frac{5}{11}$	$1\frac{3}{11}$	$1\frac{9}{11}$
24	$\frac{5}{6}$	$2\frac{1}{3}$	3
30	$1\frac{1}{4}$	$3\frac{1}{2}$	5
36	$1\frac{2}{3}$	$4\frac{2}{3}$	$6\frac{2}{3}$
42	$2\frac{1}{7}$	6	$8\frac{1}{2}$
48	$2\frac{1}{2}$	7	10



apart without damaging the concrete.

If the earth is sufficiently firm, the wall base may be cast in a straight-sided trench as shown, otherwise form boards will be required for the base.

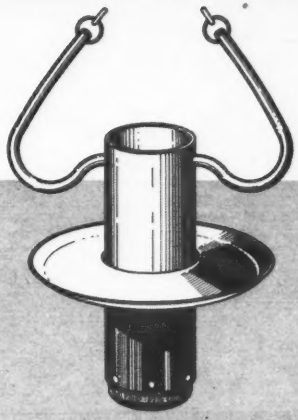
The forms should be braced as shown in Fig. 8, and wood spacers and wire ties employed for holding the form faces the correct distance apart. If the wall is not to be painted or stuccoed, coat the form faces with a mixture of kerosene and lubricating oil. This will prevent the forms from sticking to the concrete. Where it is desired to paint or stucco the wall, paraffin oil should be substituted for the lubricating oil.

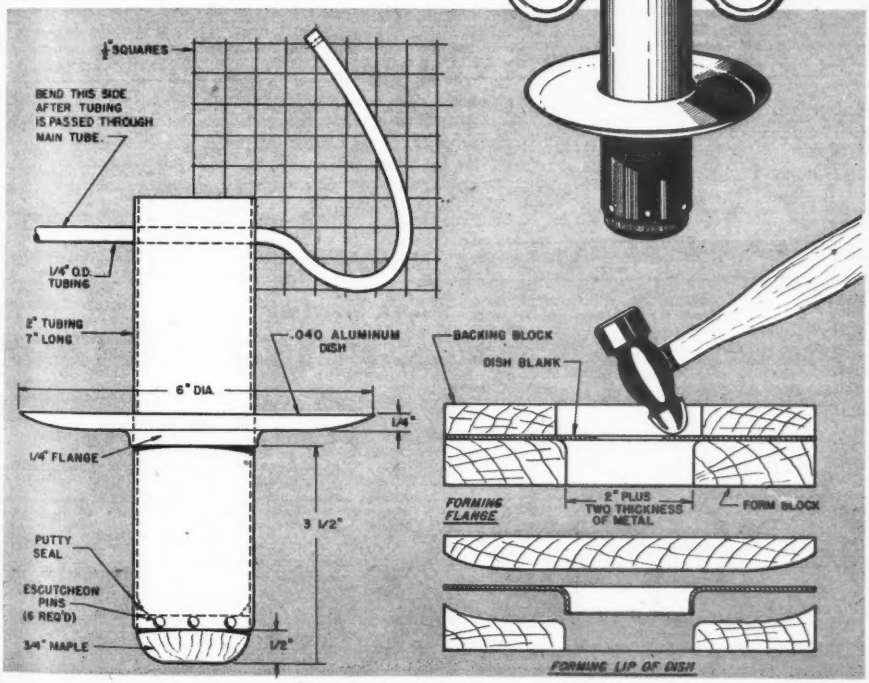
Fig. 9 gives the quantities of Portland cement, sand, and gravel or crushed stone required for each running foot of wall of various heights. The quantities include an allowance of 10 per cent extra for waste and for the type of aggregate (sand and gravel) employed. In using this table, it is only necessary to multiply the quantity of each ingredient given by the number of running feet of wall to be constructed to ascertain the total quantities of materials required. Hence for a wall 30 in. in height and 20 ft. in length, the materials needed would be 25 sacks of cement, 70 cu. ft. of sand and 100 cu. ft. of gravel. Cement is sold in sacks containing a cubic foot. Sand, gravel and crushed stone are generally sold by the cubic yard (27 cu. ft.).

In mixing concrete for retaining wall construction, use one sack of cement to 2¾ cu. ft. of sand and 4 cu. ft. of gravel. A bottomless wooden box one foot square and one foot high [*Continued on page* 136]

Hanging Garden

NEBUCHADNEZZAR gratified his queen by erecting one of the "seven wonders" of the ancient world—the Hanging Gardens. Our little hanging garden can't compare with the Babylonian structure in elaborateness, but then, you don't have the money and manpower at your disposal that King Neb had; so you needn't have any qualms about offering it to the lady in *your* life. Seal one end of the 7-in. tube with a lathe-turned piece of hard maple, escutcheon pins, and waterproof putty. Make the flanged dish, as shown, with the help of wooden form blocks, drill six holes through the flange and tube, and rivet together, using a round bar on the inside of the tube for backing. A shaped ¼-in. tubular handle and a length of chain complete the garden with no more trouble than it takes to say Nebuchadnezzar.—*R. J. De Cristoforo*





car care

Photo by Robert Brightman

Two dissimilar metals in the Electromotive De-Ruster set up an electrolytic action in the radiator. This, according to manufacturer, makes the rust stay in suspension.

If the brakes are noisy, and if you have checked them for unevenly adjusted shoes, loose backing plates or warped drums, be sure to consider the brake cylinders which can become loose. A cocked cylinder will cause uneven engagement and noise.

Gasoline gum, settling in the intake manifold, will disturb carburetion and cut gas mileage. Clean out the manifold whenever doing a motor job. Acetone will do it.

Rusty breaker points indicate too much condensation within the distributor. Drill a vent in the cap or open up the old vents.

Tar remover is excellent for taking off paint which the car's fenders may have scraped from garage doors. But don't forget to re-wax.

Most defrosting systems work better when the car's heater is operating at the same time.

BEHIND THE WHEEL

With Fred Russell

If you want a personal reply, please include a self-addressed, stamped envelope.

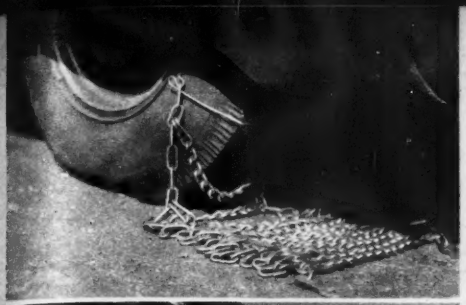
What causes the rear end of my 1947 Studebaker to rumble when going up a hill with a load? Checking the shock absorbers helps for a few days and then the trouble starts again. Ralph S. Hardiman, Hartford, Conn.
The shaft and the universal on your Studebaker may be a little too light on your model. Shock absorbers with better compression control or possibly heavier rear springs may help.

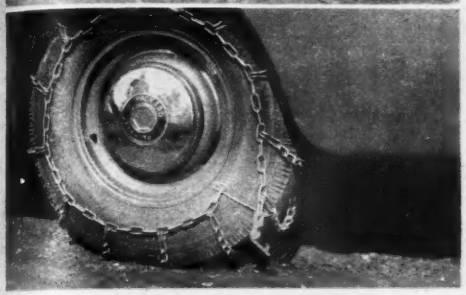
My 1947 Chevrolet runs fine but, at high speed it starts to cough and I begin to smell burned rubber. Jimmy Mercer, Memphis, Tenn.
Muffler or tail pipe may have been accidentally covered with undercoating.

I'm troubled with static in my 1948 Kaiser. It will even occur when the engine is turned off and the car is coasting. If I stop the car with the engine running, then the noise will cease. Can it be the wheel hubs? Spencer A. Henry, Kansas City, Mo.
Sounds like static generated by the tires. This can be removed by blowing a special powder into the tubes.

Every 5 or 6 days the battery on my 1941 Ford runs down. Most of my riding is by day. F. Forster, Baltimore, Md.
Your generator charging rate may not be high enough or, possibly, the regulator isn't set properly. Check for sticking cut-out points which would allow the battery to discharge back into the generator when the motor is off.

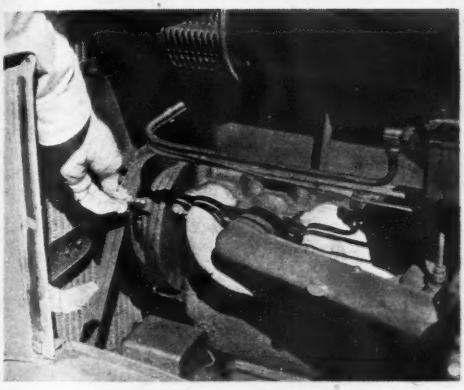
What causes my 1933 Chevrolet to chatter in reverse after I installed a new clutch in it? The motor seems to move the floorboards when I am on a steep hill. T. M. Swanson, Waukegan, Ill.
The motor is loose in its moorings.





No excuse to drive without chains this winter with this handy applier. Loop it over the tire, attach the chains and drive the car forward one complete wheel revolution.

Brake pedal slack should be tested daily. If gone, or decreased, pressure may have built up due to clogged relief port in master.

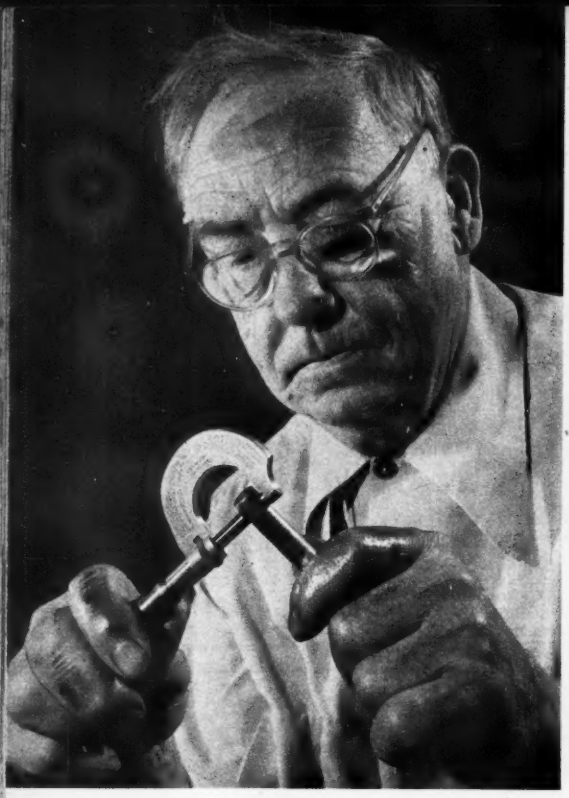


Loss of anti-freeze can sometimes be traced to leakage through the water pump grease fitting where cars are so equipped. Check this by keeping nipple cap tight.

Moisture in the cap of the coil will make starting difficult. Easier starting will result if spark plug porcelains are kept clean.

Cupped wear on treads of the new low pressure tires is quite common. Remedy this by keeping pressure at 28 pounds instead of recommended 24 and by rotating them.

Keep that hood latch greased if you want to be able to unlock it without a struggle. Latch should be adjusted to keep hood snug.



First Prize ($10.00) .....Master Machinist
Taken by Jack Pelletier of Los Angeles; press camera.

$5.00 Award .....Lonely
Ed Schnitman of Waterbury, Conn., used a 4x5 camera; Superpan film and one No. 1 photoflood.

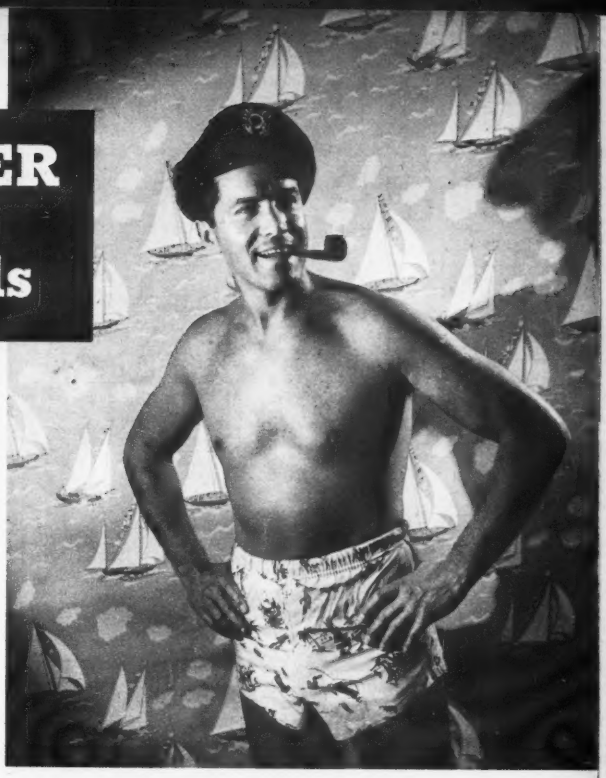
Monthly Photo Contest

Please put your name, address and picture-taking data on back of each print. Wrap with cardboard stiffeners and enclose a self-addressed stamped envelope or postage for return of unused photos. Prize-winning pictures are not returned. Judges are MI Editors. Duplicate prizes awarded in case of tie. Address: Monthly Photo Contest Editor, MECHANIX ILLUSTRATED, 67 W. 44th Street, New York 18, N. Y.

$5.00 Award .....Female Stag Line
Graflexed by A. Schoeni of Arlington, Va. Telephoto lens.

$5.00 Award .....“Now What?”
Rolleiflexed by Miles Overend of St. Marys, Ont. Plus X film; photoflood and one spot.

WALLPAPER For Picture Backgrounds



WALLPAPER is inexpensive, colorful, and picturesque—in short, it is ideal as a background for portraits, still life and table-top set-ups. It is best used when mounted on rolls. Use cardboard tubing of fairly large diameter, not less than 2 in. across. Short tubes can be lengthened by splicing two sections together over a length of narrower tubing.

Before cutting the roll of wallpaper into lengths, make sure that the patterns will match. To do this, first cut a strip to the desired length and lay it out on the floor or table. Then unroll the next strip alongside the first and shift it up or down until the pattern matches. •

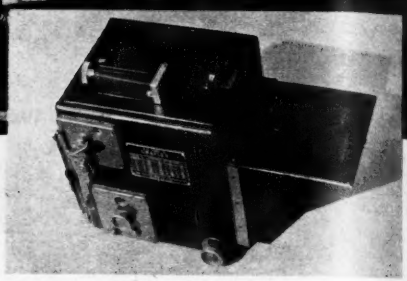
Note how the "knotty pine" wallpaper blends perfectly as a background for this portrait. Before cutting the wallpaper into required lengths, make sure that the patterns will match correctly.

Photos by Louis Hochman

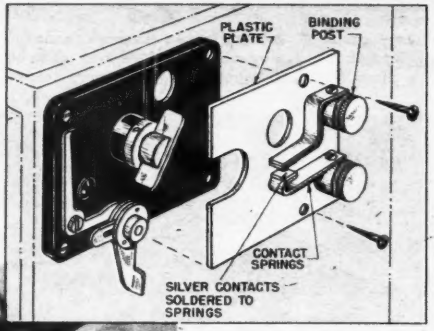
Below: Taping the background to a mailing tube. Tubes can be lengthened by inserting cores.

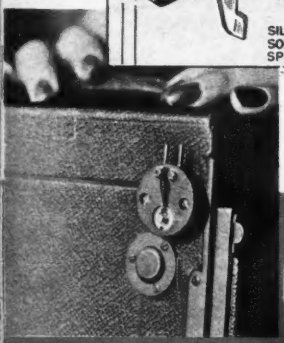
Wire clothes hooks are ideal for suspending the rolls.

MODERNIZE YOUR GRAFLEX

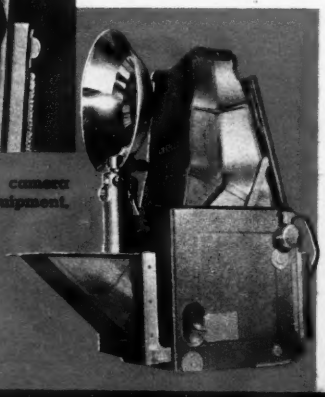


The Graflex, modernized as described in text is ideal for sport shots. Photo at right shows installation of direct view, tubular view finder.





Above: Detail of home-made flash synchronizer. Flash bulb is in series with battery. Left: A commercial flash installation.



The revamped camera showing flash equipment.

- ***Flash Synchronization***
- ***Automatic Flash Calculator***
- ***Direct View Finder***
- ***Built-in Focusing Scale***
- ***Action Shots Without Mirror***
- ***Roll Holder for Color Film***
- ***And a Foolproof Self-Timer***

By Robert Brightman

THAT old war horse, the Graflex camera, has of late been overshadowed by its more glamorous sister, the Speed Graphic. This, despite the introduction of the Super D Graflex with its automatic diaphragm. Yet, with a little ingenuity, plus the application of a few bucks, you can not only make this camera as versatile as the Speed Graphic, but actually surpass it.

"H'mm, and how? Flash, too?"

You bet! Flash, of course, is the No. 1 goal in this modernization program. A number of manufacturers will either synchronize your Graflex for flash or else will sell you the equipment so that you can

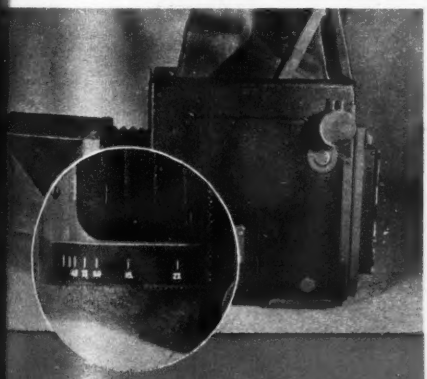
do it yourself. Most of these devices are designed to operate on the winding key of the Graflex camera or in conjunction with the opposite end of the roller. All they do is complete an electrical circuit when the curtain descends. The camera illustrated uses such a device. It was installed by Saragino of New York City. As the mirror flips up the upper axle of the curtain starts to rotate, thus completing the circuit. If you do not care to use a commercial synchronizer, you can make one very simply as per the accompanying drawing. A battery case, cord and reflector complete the installation.

Both Sylvania and General Electric manufacture special photoflash lamps for use with focal plane synchronization. They are known as 2A and 31 respectively. Unlike between-the-lens synchronization, focal plane synchronization works best at high speeds. *Always use the highest tension on the shutter when making flash shots.* The flash factor for a high speed film such as *Super XX* and *Superpan Press* is 110. Use a flash factor of 77 for *Plus X* and *Supreme* film. The correct "f" value is obtained by dividing the distance to the subject into the flash factor. Use a shutter speed of 1/295th.

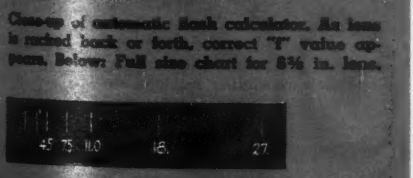
Automatic Flash Calculator. However, in order to avoid any mental gymnastics when using flash bulbs, the addition of a "flash" scale will automatically determine the correct "f" value to use at this speed. As the lens is racked back or forth for different distances, the chart on the side of the camera will move accordingly. The nearest "f" value to the end of the camera is the stop to use. This scale has been designed to work with a shutter speed of

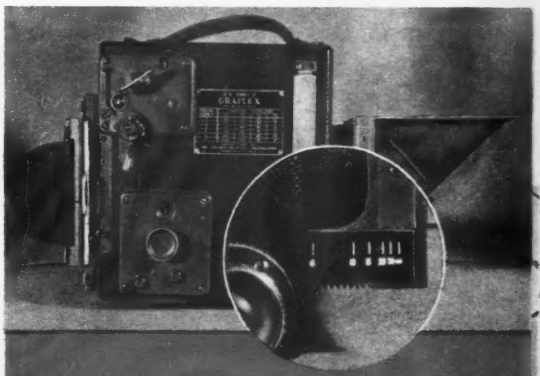
Taking an indoor picture is now a cinch. Flash factor for a No. 31 bulb fired at 1/295th of a sec. (highest tension) is 110 with Super XX film.

Here is the actual picture taken by photographer in scene at top of this page. Focal plane synchronization works best at high shutter speeds.

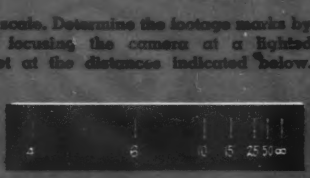


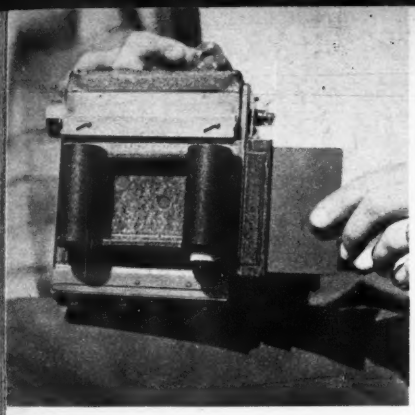
Close-up of automatic flash calculator. As lens is racked back or forth, correct "f" value appears. Below: Full size chart for 6½ in. lens.





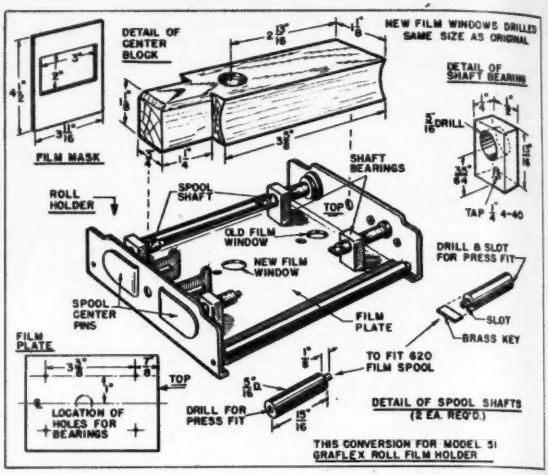
Focusing scale. Determine the footage marks by carefully focusing the camera at a lighted candle set at the distances indicated below.

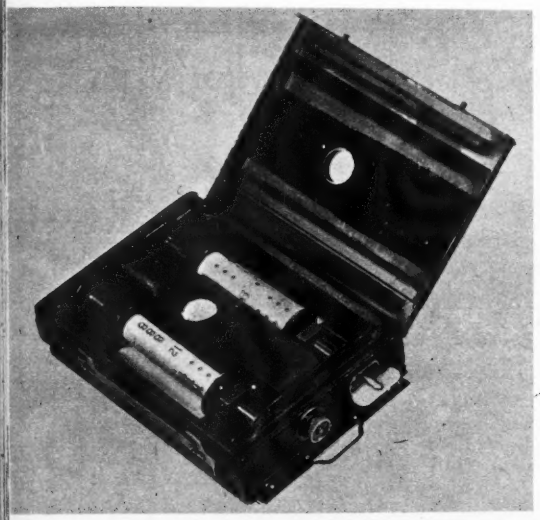




A roll holder is now available for the Graflex. This one accepts No. 120 Ansco Color or Kodacolor film.

Drawing and picture below show how an old style Graflex roll holder can be converted to take 620 film.

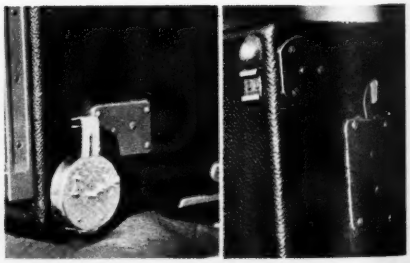




1/295th of a sec. and Weston 64 film.

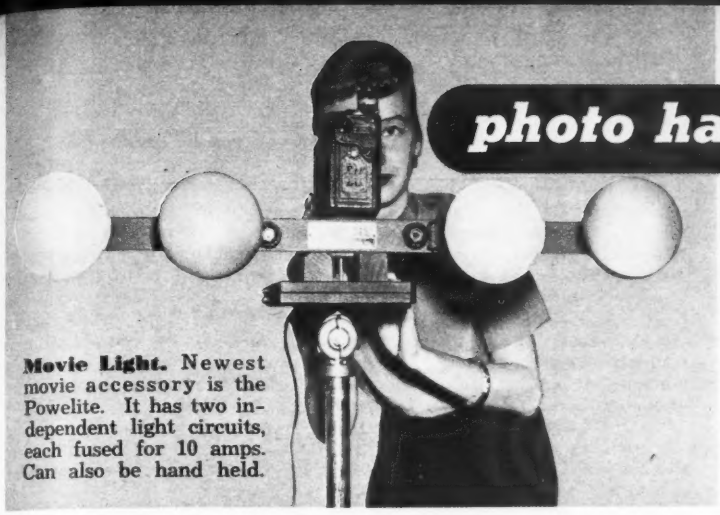
Direct View Finder. For taking action shots and for aerial photography, looking down into the hood of the Graflex can at times not only be a serious handicap, but may make picture-taking a physical impossibility such as, when shooting in a crowd. The time lag involved in the mirror getting out of the way before the curtain can drop to make the exposure very often causes the photographer to merely get the tail end of the action he was after. You can get around this by mounting a direct view finder on top of the camera. A collapsible mount can be used or, if you prefer, get one of the more modern tubular kind. The latter has a special eyepiece which can be corrected for parallax. Mount it so that the field of view is not cut off by the camera body.

Focusing Scale. If you are going to use the direct view [*Continued on page* 132]



Above: Self-timer installation. Note the shoe in photo at right. In the picture at left, the self-timer tripped the shutter and also set off the flash.

photo handies



Movie Light. Newest movie accessory is the Powelite. It has two independent light circuits, each fused for 10 amps. Can also be hand held.

QUESTION BOX

What kind of a shutter and lens have I got on my Roamer I camera? Walter A. Riddle, Green Ridge, Pa.

Your camera has a single shutter speed of about 1/60th of a second. It has an f-11 lens.

Can I use galvanized steel to make developing tanks? H. F. Wareham, Nakina, Ont., Canada.

Use stainless steel. Galvanized metal should not be used unless it is first coated with an asphalt paint.

Can you give me some information about the Petri camera? Albert Lang, Chicago, Ill.

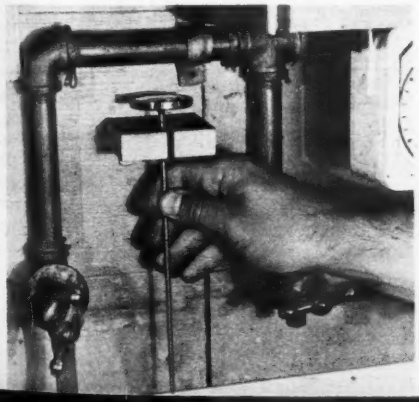
The Petri Model No. 4 takes twelve exposures on No. 120 film and has an f-3.5 lens in a Compur shutter. It sells for about $48.00.

What is a color corrected lens? John Adinolfi, Bronx, N. Y.

A color corrected lens means that the lens has been corrected so that all the colors of the spectrum lie in the same plane. In other words, the red image will not focus ahead of, say, the blue image. If it did, the picture would be slightly fuzzy. Most modern anastigmat lenses are corrected for color work.

Reminder. Frustrated feeling of opening an empty film box can be avoided by marking contents after withdrawing film.

Safety Isle. Your Weston darkroom thermometer will last longer if you keep it in a rack as shown below. Slot a block of wood and use two angles for mounting.



Space Saver. An ordinary wire clothes hanger will enable you to hang a half dozen film holders in the space formerly occupied by one. Kink wire as per inset.

Fabric Wall Covering

[*Continued from page* 107]

the seams and carefully butting the edges together. Smooth with a stiff brush, working it from side to side rather than up and down. This tends to keep the moist fabric from stretching and makes it easier to match the pattern. Finally, roll the seams lightly, wipe the surface with a damp sponge to remove finger marks and excess paste, and cut off the extra material, top and bottom.

The material is applied to a ceiling in the same manner as to a wall. It is advisable to cover the ceiling before doing the wall installation. Place a plank and two stepladders, chairs, or sawhorses so you can reach the ceiling where the first strip of paper is to be hung. Then mark a guide line along the ceiling to assure that the first strip will be placed parallel to the starting wall. For easy handling, drape the strip over a 4-ft. wood or cardboard pole held in the left hand and smooth it onto the ceiling with the right hand. For the most satisfactory joint between the walls and ceiling, extend the ceiling fabric down on all walls about 1 in. and mark and trim for a ¼-in. overlap. This overlap will be covered later with wall fabric. Whenever practical, hang the ceiling strips so the seams run toward the window side of the room—this makes the seams less conspicuous.

WALL-COVERING ESTIMATING CHART

NOTES: 1. One single roll of wall fabric is 3 yards long and 48 in. wide. The material is also available in four-roll bolts, each of which is 12 yards long and 48 in. wide.
2. Deduct 3 yards of material for every two average windows, doorways, or other openings.

Room Size (In Feet)	Number of Rolls Req. for Walls			Yards of Border Required	Number of Rolls Req. for Ceiling
	7-Ft. Ceiling	8 or 9-Ft. Ceiling	10, 11, or 12-Ft. Ceiling		
6 x 10	6	8	11	11	2
6 x 12	8	9	12	12	3
8 x 10	8	9	12	12	3
8 x 12	8	10	14	14	3
8 x 14	9	11	15	15	4
10 x 12	9	11	15	15	4
9 x 12	9	11	15	14	4
9 x 14	10	12	16	16	4
9 x 16	11	13	18	17	4
10 x 14	10	12	16	16	5
12 x 12	10	12	16	16	5
10 x 16	10	13	18	18	6
12 x 14	10	13	18	18	6
12 x 16	11	14	19	19	6
14 x 14	11	14	19	19	6
12 x 18	12	15	20	20	6
14 x 16	12	15	20	20	6
14 x 18	13	16	22	22	8
16 x 16	13	16	22	22	8
16 x 18	14	17	23	22	8
16 x 20	15	18	24	24	10

Modernize Your Graflex

[*Continued from page* 130]

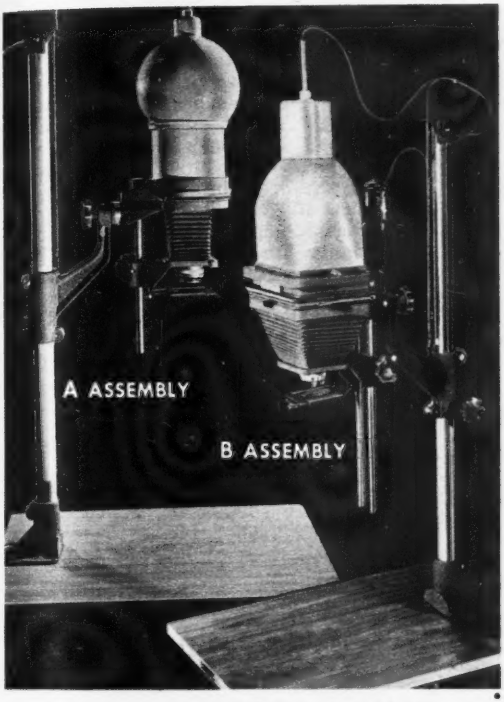
finder some means of being able to focus the camera without having to refer to the ground glass is desirable. This can be easily accomplished by mounting a focusing scale to the right hand side of the lens mount. Paste a piece of white paper to the right hand side of the lens support and focus the camera at infinity. Draw a pencil line across the paper at this particular point. Then, measure off 50, 25, 15, 10, 6 and 4 ft. intervals and similarly determine these distances on the scale by focusing the camera carefully at a lighted candle moved to each point. Remove the paper and transfer the markings.

Action Shots. To take an action shot, then, all you will have to do is to rack the camera out to the desired distance and apply the eye to the direct view finder. But, what about the mirror? After all, we just said that the time delay occasioned by the movement of the mirror causes many a shot to be lost. This can be remedied in the following fashion: Move the lever on the mirror handle so that the letter *T* will show. Then set the controls to the predetermined speed. Drop the mirror out of the way by pressing down on the mirror release. The shutter, however, will not trip until the lever *M* has been pulled back. What we are doing is accelerating the action of the camera by by-passing the mirror.

Roll Holder. There is no reason in the world why you should be limited to cut film or film packs with your Graflex camera. How would you like to use Kodacolor, or Ansco Color Film with your Graflex? You can do this by converting an old Graflex roll holder to take 120 film or purchase one of the new roll film adaptors especially designed for Graflex cameras. The E. Suydam Co. of Pasadena, Cal., makes a special Roll Film Adaptor for Graflex cameras. With such an adaptor you can then easily use color film in this popular roll film size.

Self-Timer. And finally, why not get in the picture yourself? Almost every photographer worth his salt has a complete record of his family but is he in any of the pictures? No! He just trips the shutter. You, too, can get in the act with a self-timer. This is probably the simplest accessory of all to add to your Graflex. Procure any clockwork timer and add a bracket to the bottom as shown in the photograph. This bracket is then pushed into a shoe which is mounted directly below the mirror release. Instead of pushing down on a cable release, the timer, when released, will slowly descend and squeeze the release button of your Graflex. It works like clockwork—and has never failed the author. •

Magnificent Enlarging *PLUS*



KODAK PRECISION ENLARGER
(Showing A and B Assemblies)

Stand assembly takes either the *A* or *B* enlarger head. *A* assembly accepts negatives up to 2¼ x 3¼ inches . . . has friction-wheel drive for exact focusing. *B* assembly takes negatives up to 4 x 5 or 3¼ x 5½ inches . . . cooling system includes motor-driven fan. Wide selection of Kodak Ektar and Ektanon Lumenized lenses results in superb projection prints. At your dealer's.

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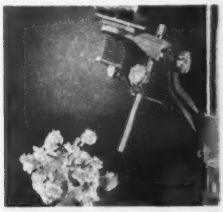
Rochester 4, N. Y.

Kodak

COPYING AND SLIDE-MAKING—Camera back adapter, bellows assembly, and lens make a fine camera. For copying, use stand assembly and copying lights.

AN INDEPENDENT CAMERA—For indoor and outdoor work, camera back adapter, bellows assembly, and tripod adapter make a "view-type" camera.



CLOSE-UP PHOTOGRAPHY—By assembling as a camera and utilizing the lengthy extension of the bellows.

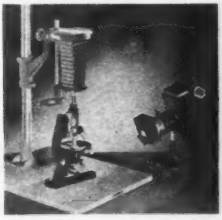


PHOTO-MICROGRAPHY—The microscope attachment makes light-tight connection with the microscope. Exposure controlled by microscope lamp.

CINE-TITLING—The inclined arm of the stand assembly supports a Cine-Kodak camera for making titles.

"Kodak" is a trade-mark

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Atlas POWER KING

MATCHED PRECISION TOOLS FOR MACHINING AND WOODWORKING

"Beware of Lightning"

[*Continued from page* 115]

wire is connected to the aerial, usually at the point where the latter enters the house, and the other is connected to a good "ground." The garden hose faucet is the ideal "ground" in most homes because it is readily accessible. To prevent the points of the arrestor from becoming bent, broken or connected together, they are usually enclosed in a plastic case, fitted with terminals for quick wiring. If the points make contact, they will obviously short circuit the aerial to the ground.

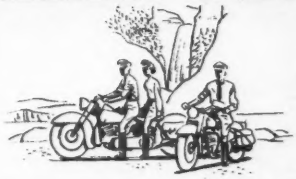
When the static electricity in the immediate vicinity of an aerial starts building up, some of it will be picked up by the wire, and it will flow through the antenna circuit of the receiver. The usual result is the grinding noise characteristic of natural static. Extra little spurts of static, building up in voltage, will cause the air gap in the arrestor to break down, and will actually spark over. While the antenna coil of the set is still in the circuit and is still carrying some of the static electricity, the arrestor *usually* diverts enough of the charge to ground to save the coil from burning out. Nothing, but nothing, will save a radio aerial, or for that matter a church steeple, a tree or a water tower, from a direct bolt.

In sparsely populated country districts, where there aren't many aerials, metal buildings, etc., to divert static charges, it is a healthy idea to supplement the arrestor with a common single pole knife switch, connected across the latter. With the switch closed, the aerial is connected directly to the ground and the hanging wire functions as a true lightning rod.

The antennas used for FM and television reception pose something of a problem from the lightning protection standpoint because most of them use a double-wire lead-in. This should not be cut or otherwise interrupted, or reception suffers. Only very recently, after thousands of television sets were already in use, did manufacturers get around to producing a lightning arrestor designed specifically for this service. It is a knob-and-cap device, with sharp little points that press into the wire and make connection to it without breaking it. Connection to a ground is made by the mounting strap, which fits around pipes up to 2 inches in diameter. If the arrestor is mounted directly on a water pipe, the ground connection is made automatically.

Some FM and television antennas use "coax" cable for the lead-in. This consists of an outer sleeve or copper wire braiding, and an inner central wire, insulated from it. The braiding itself is usually grounded at the set, and it therefore requires no arrestor. •

WORLD'S GREATEST SPORT



Ever zip over a hill with the fresh morning air in your face, a companion clinging tight and happy laughter ringing in your ears? Ever feel the thrill of swinging down a beautiful country road on a swift, sleek Harley-Davidson that seems alive with power and anxious to go places? Ever hear the roar of races, hillclimbs and other spine-tingling events that only motorcycling provides? Ever join a jolly caravan of riders on a sight-seeing tour of scenic wonderlands, out-of-way places, distant cities? If you haven't, you're missing the world's greatest sport —motorcycling! And it's so *easy* to enjoy . . . easier to own a Harley-Davidson than you think. See your dealer, mail coupon.

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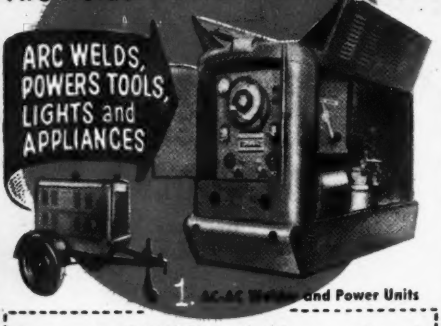
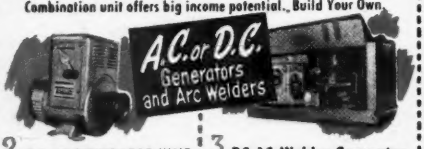


1. AC-AC Welder and Power Units

Get in the MONEY with this new equipment

Combination unit offers big income potential., Build Your Own.



2. AC-AC GENERATOR UNIT "Build Your Own." Do welding and other profitable work with this belt driven AC-AC Generator Unit.

3. DC-AC Welder-Generator Here is plenty of power for field work. Gas engine driven unit furnishes DC for welding or AC for aux. use.

4. UTILITY AC WELDER Transforms AC power supply into welding current. Ideal for light jobs

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free Welder's Guide With data, charts and other valuable information ☐

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—write in margin if necessary—

Retaining Walls

[*Continued from page* 122]

is ideal for measuring cu. ft. quantities of aggregate.

In calculating the quantity of water needed, allow 4¾ gallons per sack of cement used if the aggregate is very wet; 5½ gallons if it is average in moisture content; and 6¼ gallons if it is only damp.

Concrete should not be mixed when the temperature is below 40°F.

If the ingredients are mixed by hand, combine the measured amounts of cement and sand thoroughly by shoveling, then carefully mix in the proper amount of gravel or crushed stone. Next add the water, a little at a time, and mix until every pebble is completely coated with cement.

Where a machine mixer is employed (this is especially desirable on the higher walls or those of medium or long length), first put the full measured quantity of water for the batch into the mixer. Then, with the machine running, add part of the measured amount of gravel, then the proper amount of cement. Adding gravel to the water before the cement prevents the cement paste from sticking to the mixer drum. Finally add the remainder of the gravel and the measured quantity of sand. Mix at recommended speed for two minutes after all ingredients have been added, and be sure all aggregate particles have been coated with cement paste before dumping out the concrete.

Move the concrete to the forms with as little jarring as possible, to prevent separation of the heavier aggregate from the finer particles. Place the concrete in the forms in layers of from 6 to 10 in. in depth and in a continuous operation, to avoid construction seams. Spade the concrete thoroughly next to the form faces, using a spade or a board with a chisel-shaped end. This will insure smooth, even surfaces on the concrete. Excessive spading, however, will result in separation of the heavier aggregate. If the concrete appears to be too wet and sloppy, use slightly more sand and gravel in succeeding batches, but do not vary the quantity of water used. As concreting progresses, remove the wood spacers from the forms to prevent their being covered by concrete.

When the forms are filled to the top, level off the concrete. After the concrete has stiffened somewhat, trowel it lightly with a steel trowel, to give it a smooth finish. If water appears on the surface of the concrete, allow it to evaporate before finish troweling.

To insure strong concrete, do not remove the forms for at least a week. During this time keep the concrete and the forms constantly moist by sprinkling from time to time. •

now screening that will NEVER RUST

at an amazing low price!

NEVER NEEDS PAINTING

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CAN'T STAIN THE HOUSE

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Effects of Acids, Alkalies and Solvents—Essentially none.

Non-inflammable—Will not support flame.

Softening Point—240°-280°.

Tensile Strength, Ultimate (of filament) —Up to 50,000 lbs. per square inch.

Impact Strength—Greater than conventional screening.

Installation—Cut with ordinary scissors. Fold cut edges under one-half inch. Tack every 1½ inches through two thicknesses.

It's true. You can now get rustproof screening and save money, too! LUMITE, the new miracle plastic, actually costs only 11½-12¢ per square foot—much less than any other quality screening.

And LUMITE is lifetime screening—never rusts or corrodes—never stains paint under windows—never needs painting in any climate, anywhere. Cleans bright with a swish of a damp cloth.

If you like, you can easily frame it yourself. And when properly framed it will never sag or bulge.

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REPLACEMENT OR RETURN BY MAIL — Guaranteed by Good Housekeeping — ANY AS ADVERTISED THEREIN

Have Your Own Lasting, Successsful Business—Be Your Own Boss—Help Fill Huge Demand ... No Experience Is Necessary

Rich profits are waiting to be tapped in this *new* field. New MIRACLE finish gives a velvety, luxurious surface to radios, lamps, toys, signs, store displays, figurines, auto dashboards, and hundreds of other items. Make old objects beautiful and saleable — make new things *worth much more* with this soft, rich covering that can be applied to any surface, even if old and worn.

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Yes, you can learn in a *few days* to start MAKING MONEY! Everything you need is furnished, including fully detailed, illustrated instructions that are *complete* and *easy* to understand. Every point is explained, to show you how to start on the road to *big money*, full or spare time, right in your own home.

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In addition to full instructions, you get a complete set of materials that enables you to start at once. A few cents worth of materials can mean *many dollars* in return to you — you can earn up to $500 or $1,000 per month full time; up to $75 per week spare time.

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FLOK KRAFT
TRADE MARK REG.

Model Dream Engine

[*Continued from page* 79]

tive's boiler, holding 1⅞ gallons of water, carries a working pressure of 125 pounds per square inch. It is built of one-quarter-inch thick steel tubing and has 19 flues, each about the same diameter as a .45 pistol barrel. Mr. Bundick uses an ordinary ramrod to clean them. The firebox burns tiny grains of rice coal on a grate surface of 40 square inches. Force draft is provided by exhaust from the cylinder, blower valve and feedwater pump exhaust in the smokebox. The water supply is provided by a hand pump, an axle pump, an injector and a steam pump—all designed and made by Mr. Bundick. The twin-cylinder, double-acting feedwater pump will squirt 1.745 pints of water per minute into the boiler when operating at the rate of 200 strokes per minute.

Another ingenious device is a miniature feedwater heater which preheats the water before it enters the boiler. The superheater element raises the temperature of the generated steam to the point where condensation in the cylinders, and resultant loss of power, is eliminated. The boiler is completely enclosed with asbestos and covered with a jacket of stainless steel.

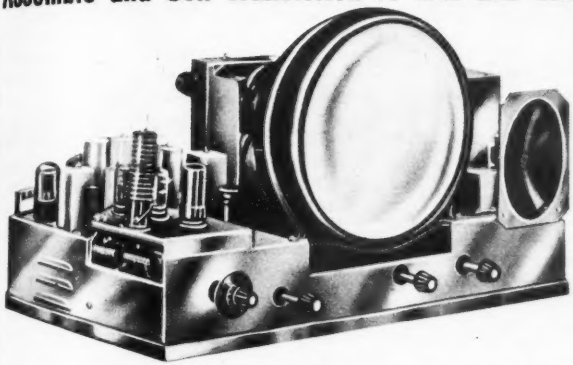
The mechanical parts consist of two high-pressure cylinders with a stroke of 1.750 inches and a bore of 1.374 inches, each equipped with a hydrostatic lubricator. The valve motion (of the Baker type predominantly used on the New York Central's Hudsons) is so accurately built that even steam distribution is assured at all speeds. All castings, including the corrugated cab deck, were made from the builder's own patterns. All 26 wheels on the locomotive and tender are fully sprung and equalized. The locomotive develops .865 hp at four mph and .218 hp at one mph. Its safe speed is about 10 mph and it will pull a weight on flatcars of approximately 1,000 pounds.

The most soul-satisfying experience in the life of any Live Steamer, like Mr. Bundick, comes from driving his locomotive. Since an engine of this size is too small to permit the engineer to sit completely in or atop the tender, a trestle about three feet high is set up, enabling the engineer to ride side-saddle on the first flatcar behind the tender.

Why do Live Steamers take such pains to build, maintain and (occasionally) operate these intricate little steam locomotives? Probably—says "L.B.S.C.," nom-de-plume of England's foremost Live Steamer—"because they can't afford to buy a full-size locomotive or have no place to run it." Which is a pretty good explanation. •

Men...Get into the Television Business in a Big Way!

Assemble and Sell Transvision TV Kits and Cabinets—Make Big Money!



TRANSVISION

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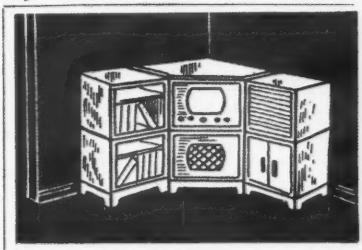

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I'm a Cabinet Maker

[*Continued from page* 91]

pieces for shipping, I include in the package glue, all hardware, even nails and sandpaper—everything necessary to put the furniture together in the quickest time. To make assembly as easy as possible, I advise my customers not to use screws but to nail the pieces together while the glue sets.

My customers are the most grateful people in the world. This mail-order setup offers them good furniture and built-in units they could never make themselves and could never afford, if they had to get a carpenter to come to the house to do the job. Because I did the millwork, one woman got for $8.59 a bookcase that a cabinet maker estimated at $25. Another family was able to assemble a big storage wall for $156. A department store had offered them the same thing—for $300.

But besides the cash savings there's another reason why I have grateful customers. They're proud as drum majorettes of their design and assembly. They all write me about how they finished the piece and how it looks in the house.

Some of their projects are amazing. One man sent me a sketch for a china closet, with a door that opens up into a dining table. I've finished making the pieces for that closet, and I can see it's going to work beautifully. A young doctor's wife wrote that her husband had dropped everything to put together a series of cupboards for the children's room. She hadn't seen him so happy since the day he got out of the Army.

You know, these people really are making their own furniture. I consider myself simply the medium through which they express themselves. They haven't the tools—so I merely do the millwork for them.

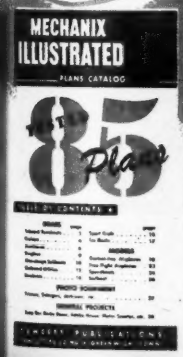
I believe prefab furniture has a big future. The whole trend in house furnishing is toward the make-it-yourself idea. The paint makers started it with foolproof paints that do a good job, no matter how little you know about painting. With foam rubber on the market now, it's easy to do your own upholstering. People who put down their last savings on a house have to do things themselves these days, especially since there's such a shortage of skilled labor.

You can make a good spot for yourself in this new prefabricating field—if you can do two fairly simple things. First, you need a little skill in woodworking and some knowledge of cabinet making. Since I was a 16-year-old apprentice, I've read every book I can find on cabinet making. I'm 38 now. You don't have to put that much time into study,

[*Continued on page* 144]

build your next boat from . . .

MI PLANS



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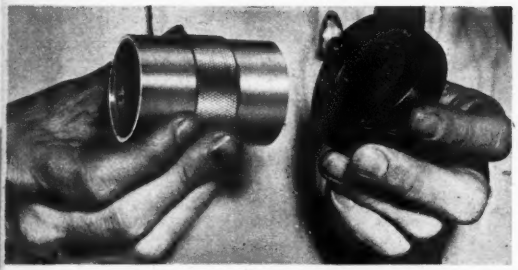
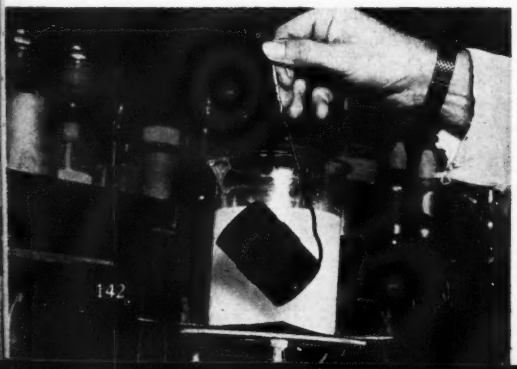
The Amateur Telescope Maker's Page



At right is a concave 7 in. tube bushing anodized black. Bronze focusing eyepiece adapter at the left was similarly anodized to prevent tarnishing.

First step is to degrease the fitting in the brass cleaner; use at 200°F. Then rinse in cold water. Below: Second step is to immerse the part in the brass blackening solution for 5 minutes at 220°F. Then rinse it under running water and dry.



Blackening Brass

As a means of killing unwanted light reflections, the tube of your telescope should be completely blackened. This can be done very easily by painting the inside with flat, black coach paint diluted with turpentine, by spraying the inside with rayon or cotton flock or by lining it with cotton suede paper. However, when we come to the matter of blackening lens mounts and fittings, these methods are rather impractical. Flock has a tendency to shed and paint may chip, depositing tiny black flakes on the optical surfaces.

A better method is anodization. This treatment yields a beautiful, smooth black surface that will not chip or crack. One method, developed by the Enthone Company of New Haven works well with brass containing at least 90% copper. The work is first thoroughly cleaned with a good alkali cleaner. This is necessary to degrease it as the process will not work if any part of the surface is the slightest bit oily or dirty. After a rinse in cold water it is then dipped in a solution of equal volume of hydrochloric acid and water. It is rinsed again and then immersed in 1½ lbs. of Ebonol C to a gallon of water. The operation should be conducted at the boiling point of the solution. Again it should be rinsed in water. The brass article, at this stage, will have a very fine microscopic "velvet" nap. If the fitting is part of the inside of an eyepiece where the fingers will not touch it, it can be left in this stage. However, if it is to be handled, the nap should be rubbed down. This was the technique employed with the brass focusing eyepiece adapter shown in the photographs. The adapter, supplied by Harry Ross of New York City, tarnished quite badly due to the perspiration on the fingers. Anodization yielded a smooth, black finish which enhanced its appearance greatly.

Prisms and Diagonals

There are two methods by which the rays from the main mirror can be brought to the eyepiece for examination. One method, the most common one, is to use a right angle prism. This will divert the rays 90° from the axis of the telescope tube so that it will be brought to a focus unhindered by the observer's head. Another method is to use a diagonal or "flat" as it is sometimes called. This is merely a mirror with the silvering on the back. Many of our readers have written asking whether the hypotenuse side of the prism should be silvered. *No. It is a totally reflecting surface.*

If your mirror is of average focal length, about 54 in., a prism having a 1 in. face will do nicely. If you use a diagonal it should be ground down into the shape of an ellipse as the corners will serve no purpose other than to unnecessarily obstruct some of the light reaching the main mirror. •

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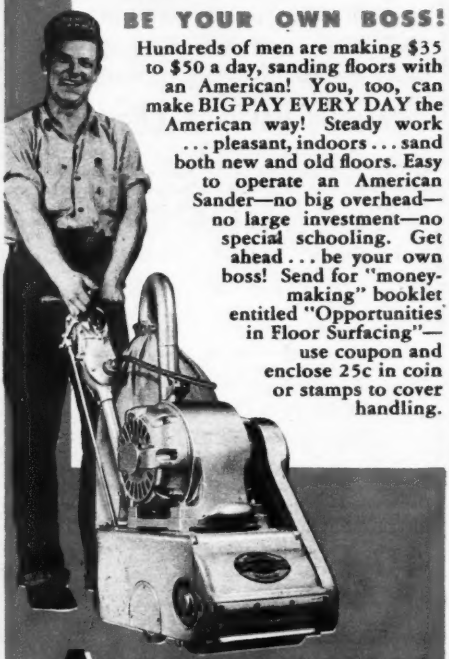

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I'm a Cabinet Maker

[*Continued from page* 140]

of course, but it'll pay you to haunt your public library for a while.

But you can be a "top drawer" cabinet maker and still fail as a prefab man if you don't learn the second little "know-how"—skill at estimating costs. If I look at a sketch and say, "Okay, it will cost $10," and the materials and labor finally cost me $15, I'm licked. I had to learn how to look at a sketch and tell at a glance just how much it would cost.

Here's something else you should know, too: a good source for flat lumber—a big factor in my own success. I use only kiln-dried lumber. I pay more for it wholesale than most people pay for ordinary wood at retail. But I have to pay that extra cost. My prefab pieces go out all over the country and I never know what conditions they'll meet. If a board should warp, I'd get the whole thing right back in my shop—a lot of work and still no sale.

If you've got the skill and the will, hop to it. There's plenty of prefabricating for everybody. As that musician sang out to me a couple of years ago, "Just cut the pieces..." And you'll soon find a postoffice full of customers putting together a new money-making business for you. •

Prehistoric Monsters

[*Continued from page* 83]

moha in Queensland but it has never been seen in this country. Yet last winter a mammoth animal tried to climb a Florida sea wall. The next morning, early swimmers found great Nuihi-like tracks in the sand!

Scientists who have studied reports about serpents, have decided that there must definitely exist some unknown sea creature which vaguely answers the descriptions given down through the ages. It seems to come to the surface in warm weather and it is probably not a snake. More likely, it is a warm-blooded mammal like the whale. One of these scientists said, "If you compare the whale to the elephant, the unknown animal should be compared to a giraffe; not much larger than the whale but of a stranger shape."

A few years ago, fishermen in South America caught a latimeria—a large fish that was supposed to be extinct 60 million years ago. It caused many to wonder if we have fully explored the fringes of our animal world.

Reliable sources have been hinting to us for generations that there are creatures existing which we have never seen. Will they be dreadful throwbacks to another age or inconceivable monsters of the future? •

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Highway of Diamonds

[*Continued from page* 66]

white people and twice as many natives make up the population. They're all subject to daily searches, and constant sifting and sorting of their belongings. Their only human contact with the outside world is the lorry caravan which brings in supplies to enable them to keep up the search for more diamonds. And even the lorry men keep their distance for fear of arousing suspicion.

The superintendent, Schweiger and I set out in a jeep at daybreak for the mine diggings. We visited several pits, each approximately 10 miles square. The whole system has been standardized. First, they dig a "prospect" trench straight across the sand from the ocean to the sand dunes. Twenty white bosses and 70 Negro diggers toil on that job for three months or more. It may turn out to be a dud or it may be worth a million dollars—there's no telling.

"Prospectors first found diamonds high up in those mountains," explained the superintendent. "But through all these centuries, the Orange River has been gnawing and tearing through the diamond-bearing formation, bringing the treasure down here. This whole coast has been plastered with six feet of sludge, pulverized rock and debris, studded with precious stones. Listen!" he pointed solemnly out to sea. "I'll bet there are millions of carats out there on the bottom of the ocean."

Several hundred natives were digging in gravel. Each gang had its own sieve or vibrating machine into which shovelfuls of soil were tossed. Screenings were brought to a mine boss for a first sorting. While we watched, the super picked out seven carats.

Promising gravel is transported all the way back to the main works for the experts to look over. They figure on one carat out of every 3½ cubic yards of matter and a handfull of diamonds from 700 tons of sand.

One of the natives gave a loud yell. "He's found a big one," said the superintendent. "He isn't allowed to touch it, only point and yell." The digger had discovered a ten-carat stone worth at least $25,000. He got a bonus of 10 cents a carat for finding it.

One native had once "pointed" 58 carats in a single day—or $5.80 worth for him. It was a fortune to the man for his wage out there in the broiling desert is ninepence per day for the first year. If he lives through the second year of devastating sunshine and lung-destroying dust, his pay is raised to two shillings and sixpence per day.

"I should think these natives would be

[*Continued on page* 148]

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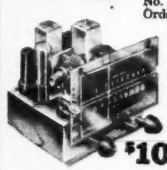

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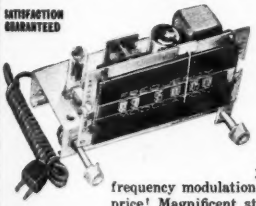

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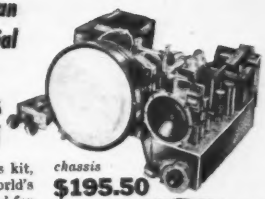

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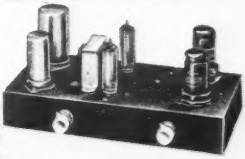

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[*Continued from page* 146]

tempted now and then to swallow a diamond or two," I remarked.

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Millions of dollars' worth of diamonds lying around loose give you a queasy feeling. It'd be so easy to pick up a few thousand dollars' worth and hide them in the heel of your shoe, the lining of your coat—you think of all the possibilities. But can you get away with it?

Before you leave, your traveling things—everything you don't have on your back—are sent ahead to the examination station at the gate. If you are a native you are detained for one week in the pen and given a knockout purge.

The day we pulled out, I was even suspecting myself. Just before we reached the gate, Schweiger stopped the car before a baked-brick building that resembled a mausoleum. A little man with a mortician's smile appeared and invited us in for a cup of tea. As I drained my cup, he rose, rubbed his chubby hands together and pointed to the back room. "I trust you won't mind—just a formality you know," he said gleefully.

For a moment I was afraid he was going to operate, just to make sure I was not getting away with a bellyful of diamonds. But, no. They have devised a more humane way of peering into internal hiding places. I was helped into a sheet, stretched out on a cold metal slab—and X-rayed.

As we drove along the winding desert road after the De Beers gate had closed behind us I thought of the civilization which treasures the pieces of stone mined by those sweating workers at Orange River. Suddenly, the wheels of the car went over a rock. Almost hopefully, I looked out of the window, half-expecting to see a large diamond lying in the road. But of course it was strictly a non-precious rock. The fabulous highway of diamonds was securely locked in behind those carefully-guarded gates. •

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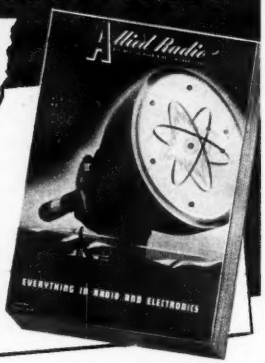

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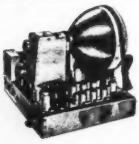

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Is Your Job Killing You?

[*Continued from page* 69]

When a customer demanded sugar, all Mercuri's pentup frustration with his job exploded. According to police, he tossed the annoying sugar shaker through the plate-glass window, pitched out the coffee urn, dumped dishes, chairs and pastry into the street and made a shambles of his shop.

William Cimillo got fed up with the monotony of driving a bus in the Bronx. One morning he drove his bus out of the garage as usual, rolled past a regular bus stop—and kept right on rolling—all the way to Florida. Because thousands of other Americans were bored with their work and longed to get away from it all, too, he became a hero and got his old job back again—with prestige he never knew before.

Workers seldom are as lucky as Cimillo when they blów their tops. Last year some 17,000 workers dropped dead on their jobs—and thousands more literally worked themselves to a slow death through tension and anxiety. Heart disease—top killer in the nation—high-blood-pressure, ulcers, diabetes and arthritis are some of the troubles that may be traced wholly or partly to emotional conflicts and worry, such as daily beset the man who is unhappy or bored with his job.

Psychiatrists find that there is a subconscious urge to kill yourself on the job if you're dissatisfied with what you're doing. That suicidal drive may disguise itself as a heart attack, a "sick headache," a pain in the back or some other apparently physical ailment that will attract sympathetic attention to yourself and break the boredom or let you escape the tensions of your job. The sinister urge may reveal itself, too, to overexert yourself and worry your life away to master a job you secretly hate.

Or the desire to do away with yourself may show up in a marked tendency to accidents. Recent industrial studies disclosed the strange fact that practically all the accidents kept happening to the same 20 per cent of the total workers. Case histories indicated that these accident-prone people not only were "hard-luck" repeaters but actually went more than half-way to get hurt.

A public utility company had so many accidents among car-driving employes that insurance costs zoomed sky-high. A small percentage of the men were having nearly all the accidents, surveys revealed. When the company weeded out these chronic casualties, the rate dropped from one accident every 12,000 miles to one every 56,000.

There was no difference in the trucks, driving skill or physical condition of these men.

[*Continued on page* 152]

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Hundreds of Improvements

NEW Crosley Deluxe Sedan is bigger! It's the latest word in American design—new speed line styling, sweep fenders. New, rich interior, choice fabrics. Seats 4 with ample luggage room.

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Is Your Job Killing You?

[*Continued from page* 150]

But there *was* something different in their heads.

While there is no certain way of putting a finger on an accident-prone person before an accident happens, the work of Dr. Flanders Dunbar and other psychosomatic authorities gives a revealing picture of his temperament.

Primarily, he hates to be bossed around. He carries a chip on his shoulder to his superiors, but it's usually not his boss but an accident that knocks that chip off. For when he swallows his resentment, he becomes reckless and invites an accident. Often his parents, especially his father, were unduly strict and tyrannical. The boss is something of a substitute father who must be shown that he can't get away with brusque orders.

A high school chemistry student gave a good example of this unconscious attitude. His instructor warned him not to dabble with certain chemicals. The boy ignored the warning. When he picked himself up from the floor with most of his clothes blown off by an explosion, he remarked: "Anyhow, I showed him he couldn't tell *me* what to do!"

Not working may kill you, too; many men go to pieces suddenly after retirement. Work, which always represents a fight on something, seems necessary for human well-being—apart from its role in making a living.

And there is always the possibility that while your job may never threaten you physically, it may kill you spiritually by inches if it fails to provide the satisfactions it should. Experts such as Johnston O'Connor of the Human Engineering Laboratories, who measure job aptitudes, say that a strong talent is dangerous when it remains unused. Unexercised aptitudes keep gnawing away inside you and lead to feelings of frustration and failure.

You may then wonder whether you should change jobs to get that dream work.

Job shifting isn't easy but it's being done all the time by men who get a clear idea of where they want to go. The work history of many "big wheels" isn't far different from that of K. T. Keller, who stepped into a $75-a-week job as secretary but quit at 21 to take a 20-cents-an-hour job—in the shops! He loved machinery, and his love paid off—he now heads Chrysler Motors.

So, decide what you actually want to do for a living, then pour all your hidden energies into a healthy drive toward doing the work you like and achieving not only success but—more important—real happiness. Remember there are now more than 60,000,000 jobs in this country of ours. If you happen to have picked the wrong one of those 60,000,000 jobs for your personality, why let it kill you?

MI Tests the '49ers

[*Continued from page* 73]

of that fin-like look from the Caddy. And go ahead and laugh at those chrome ventilating ports in the front fenders. They're not built-in cannons for taking shots at taxicab drivers! And they're not portholes for midget passengers as the editor suggested when I had him out for a look. They serve a definite purpose. One of my gripes about the Buick has been the way they overheat at top speed; you should see the way they pile up along the Penn Turnpike. Those portholes should remedy this condition because their function is to draw hot air from the engine. I've seen many Buicks in the Southwest and in desert country sporting homemade vents for just this purpose.

The big item about the Buick is still Dynaflow, the new hydraulic torque converter. Introduced in 1948, it is by far the best of the automatic transmissions and clutchless wonders.

All the driver has to do is put her in gear and let the accelerator do the rest. It's quite a mechanism, but a bit too complicated to explain fully here. Basically, it's a flywheel-type pump that forces oil aginst a turbine linked to the driveshaft. When you step on the gas and speed up the pump, the oil hits the turbine with greater force, delivering more power to the wheels. At low speed the oil flow is directed by means of a system of three intermediate turbine wheels which are, in effect, step-down gears.

The car has a hand gearshift with a position for LOW, which is used for climbing the side of a building, and REVERSE. The system is virtually foolproof; you can let the little woman work on it all she wants to and she can't strip anything.

The '49 engine is essentially the same as the job that has been whipping Buick over the highways for the past year, except that it has had its valves lifted . . . hydraulically. They're called lash adjusters and should eliminate the one great fault of overhead valve engines: noise. No longer will the clatter of tappets mar the smooth hum of an otherwise silent engine. But in addition to killing the noise, these little hootnannies keep all your valves in perfect adjustment! And this is a feature not to be sneezed at, especially in climates of extreme temperature variations where valve clearances can change drastically as the metal expands and contracts.

The car I tested was a Roadmaster, 4-door, sedan. As my test was made on roads near New York City where cops are plentiful and unsympathetic to road tests, my activities were a bit restricted, but here's what I found.

[*Continued on page* 154]

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SLICKEST WORK SAVER FOR YOUR SHOP

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The Unpublished Facts of Life

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The Rosicrucians (not a religious organization), an age-old brotherhood of learning, have preserved this secret wisdom in their archives for centuries. *They now invite you to share the practical helpfulness of their teachings.* Write today for a free copy of the book, "The Mastery of Life." Within its pages may lie a new life of opportunity for you. Address Scribe J.G.Y.

The ROSICRUCIANS
(AMORC)
San Jose California, U.S.A.

MI Tests the '49ers

[*Continued from page* 153]

The car has plenty of power, all any driver would want for normal U. S. road travel. When you stomp on the accelerator, it won't snap your head off, but this is due in part to the soft action of the Dynaflow. It's comfortable to drive; at the end of 500 miles you won't feel as though you'd been taken apart piece-by-piece and then put together again . . . the wrong way. I got it up to 94 mph and it held the road without any effort. It takes corners well, too . . . but, that's nothing new for Buick; it always was a bit ahead of its competitors in the top-speed department. My acceleration tests with the 150-hp job are as follows: 10 to 25 mph in 3.2 seconds; 10 to 45 in 9.2 seconds; 10 to 60 in 15.4 seconds; 40 to 60 in 8 seconds.

P. S. You can get the '49 in your garage; it's three inches shorter than the '48. And your garage doors will close without having to fight it out with the bumpers. •

The Editor's Workbench

[*Continued from page* 20]

der," we would have suffered far fewer casualties, and won the war much more quickly than we did.

Would that have been "progress"? Ask the widows and children and parents of the 250,000 Americans who died in World War II.

We're as much against war as any man—or magazine. We know that war is cruel and destructive and tragic. But we also know, from the bitter experience of only seven years ago, that when a peace-loving country like ours is forced into a war for which she is unprepared, war can be even more cruel and more destructive and more tragic than it normally is.

We think it's about time the "shocked" idealists stop cursing "science" as some fiendish, Frankensteinian monster dragging us all to our doom. Science doesn't start wars—people do. And we think that until the millenium arrives, when men no longer settle their differences by killing each other, we should be grateful for having on our side scientists with the foresight and ingenuity—yes, and the patriotism—to devise, *for us,* the weapons of war that may some day be the only instruments protecting us from destruction by our enemies.

Until the millenium, MECHANIX ILLUSTRATED will continue to tell its readers of the progress these American scientists are making. We think most of you want, and all of you ought, to know about it. •

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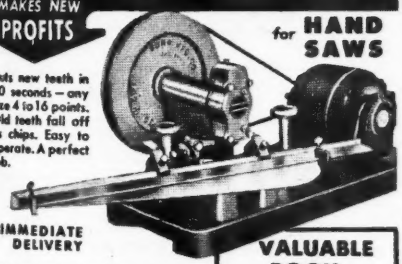

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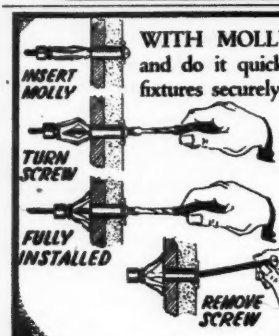

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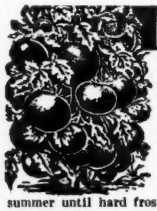

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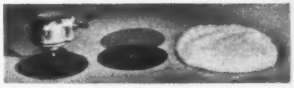

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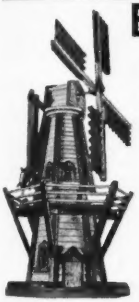

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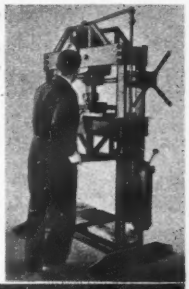

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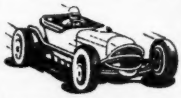

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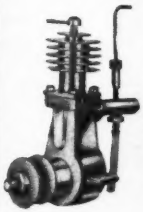

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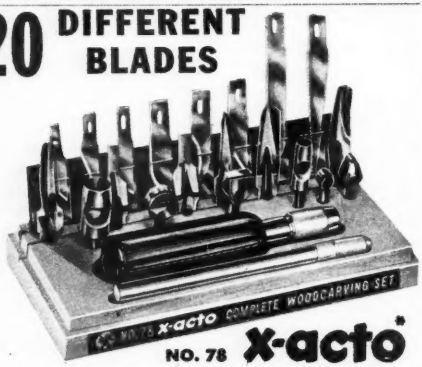

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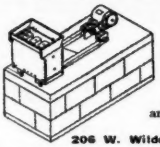

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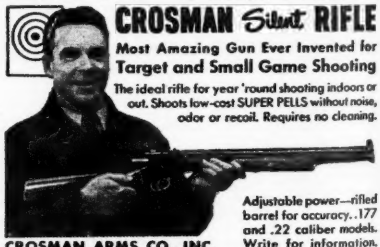

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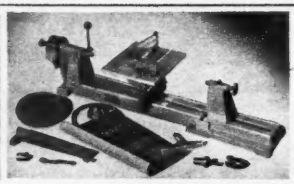

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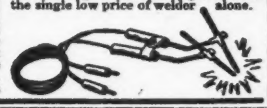

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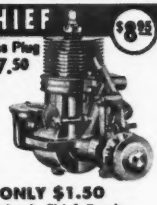

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No. 90 Magic Cards (Read from Back)	$1.49
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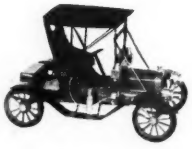

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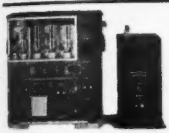

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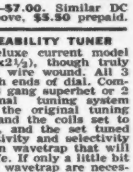

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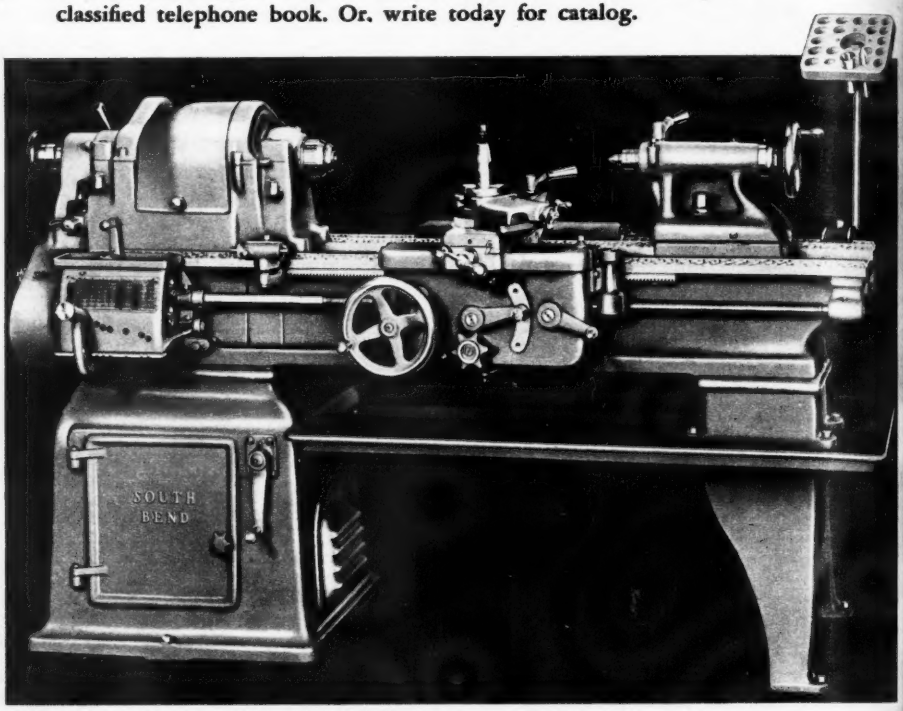

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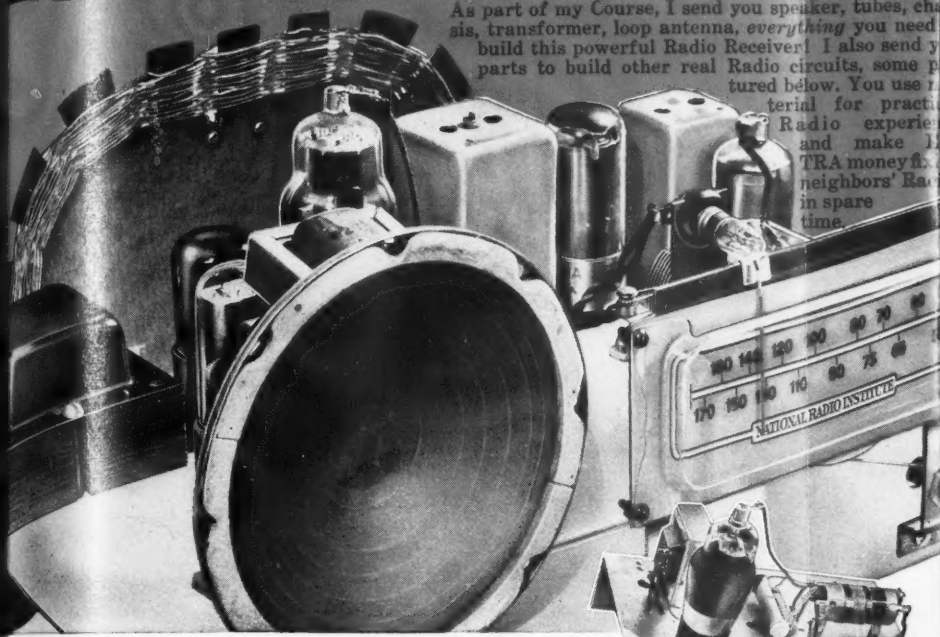

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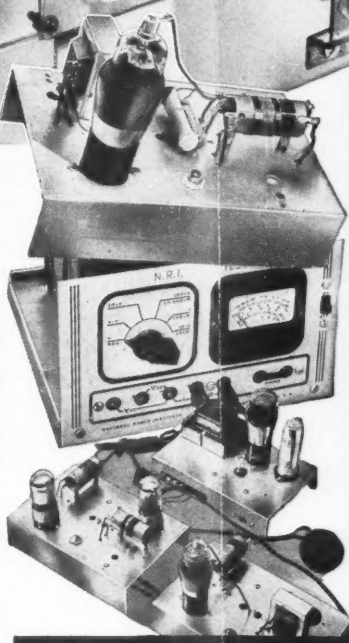

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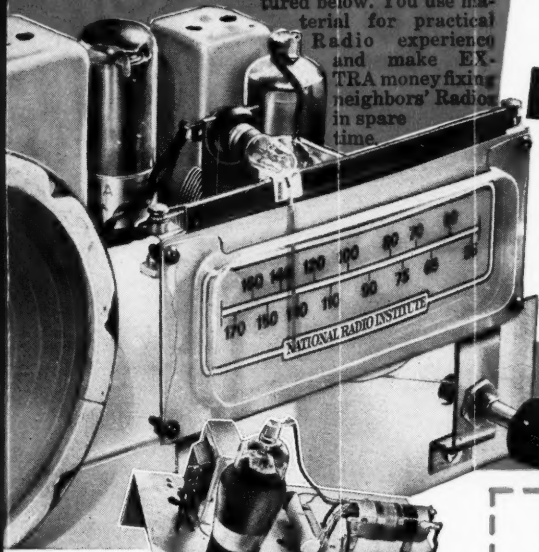

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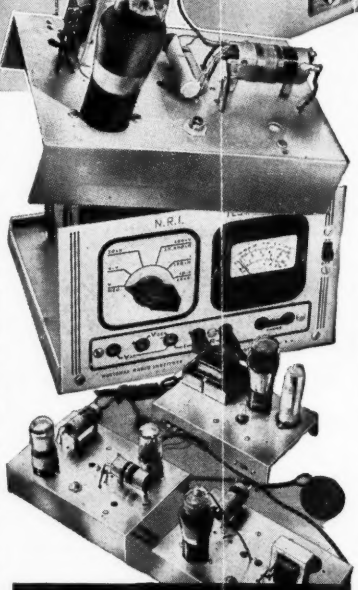

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PERMIT No. 20-R
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FIRST CLASS
PERMIT No. 20-R

"EVEREADY"

Just as an a

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new pep... so "Ev
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for extra lif

BOUNCE BACK

"EVEREADY" BATT

"Eveready" brand batteries give you fresh power when you use them; naturally, they use up some power when your flashlight is turned on ... but—

When you
cat nap bet
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energy —
that ...

● Next time you buy batteries for
get "Eveready"—the largest-selling
you'll see what *bounce back* mean
teries are *the batteries with "Nine*

"EVEREADY" FLASHLIG

The registered trade-mark "Eveready" dis

NATIONAL CARBON COM
30 East 42nd Street, New Yo
Unit of Union Carbide and Carbo

UCC

"EVEREADY" the battery with "NINE LIVES"

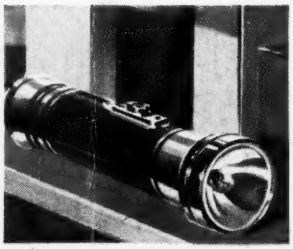
Just as an active cat...

...takes a cat nap and ...

bounces back with new pep... so "Eveready" batteries bounce back for extra life!

BOUNCE BACK gives "EVEREADY" BATTERIES LONGER LIFE!

"Eveready" brand batteries give you fresh power when you use them; naturally, they use up some power when your flashlight is turned on ... but—



When your "Eveready" batteries cat nap between uses, the chemical elements in the cell develop fresh energy — recover power — so that ...

When you snap on your flashlight again, the batteries *bounce back* with renewed power. That *bounce back* gives "Eveready" batteries *longer life!*

● Next time you buy batteries for your flashlight, be sure you get "Eveready"—the largest-selling brand in the world. Then you'll see what *bounce back* means ... why "Eveready" batteries are *the batteries with "Nine Lives"!*

"EVEREADY" FLASHLIGHT BATTERIES

The registered trade-mark "Eveready" distinguishes products of
NATIONAL CARBON COMPANY, INC.
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